THE RUBBER AGE

DECEMBER 10, 1921 VOL. X. NO. 5

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VOL. X DECEMBER 10, 1921 No. 5

A Method of Measuring the Temperature Points in the Body of an Automobile Tire

By A. O. Ashman

Physicist, Research Department, New Jersey Zinc Co.

INTRODUCTION: In connection with experimental work on tires it is desirable and often quite necessary to be able to measure the temperature under various conditions and at different points in the tire. It is obviously an advantage to be able to test any stock tire, instead of being limited to one of special construction. To this end the apparatus described in the following pages was developed, and successfully used by us.

The instrument that most readily lends itself to this use is the thermoelectric pyrometer. Thermocouples are sufficiently robust to permit the use of very fine wires and, therefore, the effect of their specific heat and thermal conductivity is negligible. Moreover, they are inexpensive though remarkably accurate and require less complicated apparatus for their use than other forms of pyrometers.

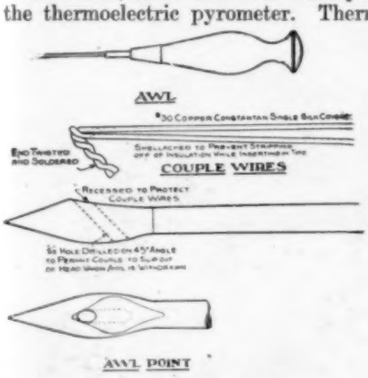


FIGURE 1

Thermocouples have been used before for measuring tire temperatures, but as far as we know the thermocouples were imbedded in the tire at the time of fabrication and, therefore, such tests were necessarily confined to these special tires.

Method: The method is quite simple and consists of actually inserting a couple in any desired place in the tire, and connecting same so that its indications can be read on a potentiometer or other instrument.

Figure 1 shows the tool used for inserting the couple in the tire.

It consists of an awl with an enlarged head through which is drilled a 1/32 in. hole on approximately a 45 deg. angle as shown. The end of the couple is inserted in the hole and bent back on itself, thus forming a hook. By slightly recessing the part of the head behind the hole the wires are protected and the whole easily inserted into the tire for a distance up to 2½ in. In withdrawing the awl the hook on the end of the couple slips out of the hole and remains tightly imbedded in the rubber tire. The whole operation can be accomplished in less than ten seconds. Lubricating with vaseline greatly facilitates this operation, but it is not absolutely essential. After inserting the couple in the tire it is connected to a potentiometer and the reading taken in the usual way.

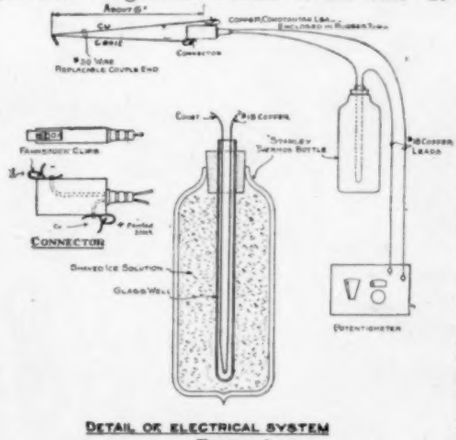
Construction of Thermocouples: No. 30 single silk covered copper and constantan wire is used for thermocouples. The use of this small size wire eliminated all errors due to specific heat or thermal conductivity of the couple. The ends were twisted and soldered for a length of about 1/16 in. They were then shellacked and dried to prevent the insulation being skinned off while being inserted in the tire. This simple treatment proved most effective in preserving the insulation and is absolutely necessary, since it is impossible to insert an untreated couple and keep the insulation intact. The fine size wire was only 6 in. to 8 in. long, this being fastened to a larger wire of the same material, sufficiently long to reach to the constant temperature bottle. The small wire couples were usually not good for more than one or two insertions, as they broke at the junction in drawing out. It is for this reason that provision was made for using short replacable ends rather than using a new 36 in. couple for each reading. Figure 2 shows in detail the construction of the connector used to join the new ends to the heavier wire. This permitted changing ends rapidly and yet insured good electrical contact.

Since all readings were taken by means of a potentiometer no errors could be introduced due to resistance of the joints.

The copper wire (positive) is about one inch longer than the constantan (negative). By connecting the longer wire to the black terminal of the connector the proper polarity is assured.

Table No. 1 gives the temperature millivolt relation for the copper-constantan thermocouples in both Centigrade and Fahrenheit units when the cold junction is maintained at the melting point of ice.

Cold Junction: The cold juction was maintained at zero by means of a Stanley thermos bottle filled with saturated shaved ice. Such a bottle will maintain a temperature of zero deg. C. for over 12 hours. The wires were introduced by means of glass wells extending nearly to the bottom of the bottle, the junction being at the bottom of the well. It may be pointed out here that when using a copper - constantin couple only the constantan element need be considered in connection with the cold junction.



DETAIL OF ELECTRICAL SYSTEM
FIGURE 2

Potentiometer: An ordinary Leeds & Northrup portable potentiometer was used for measuring the E.M.F. of

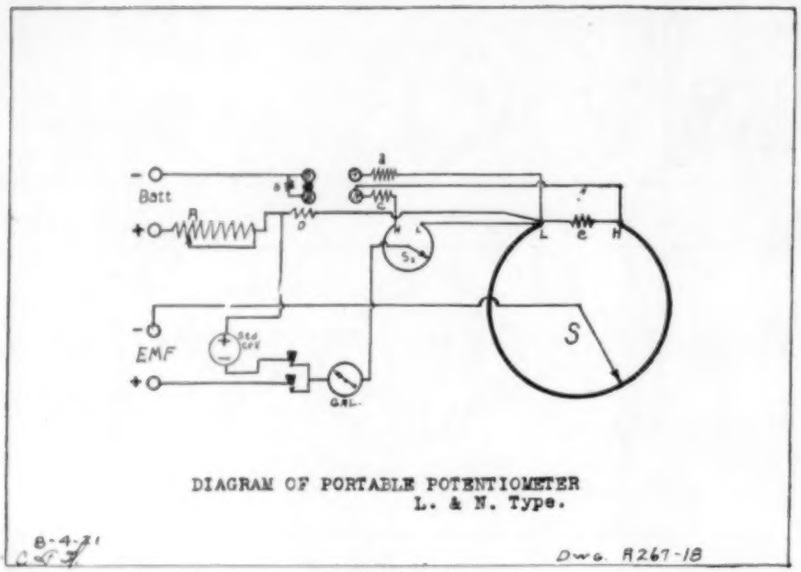


FIGURE 3

RESISTANCE VALUES

"S"=approx. 25 ohms when shunted with "e".
"S_2"=approx. 7 ohms.
"a" is such a value that will sunt the parallel resistance of "S", "e", and (e+S_2) to a fraction of the original value. (L. & N.=5 to 1, approx. 6.1 ohms).
"b" is a resistance equal to the difference between the parallel resistance of "S", "e", and (C=S_2) and the same when shunt by "a" (L. & N.=19.3 ohms).
"C"+"S_2" bears the same relation to the resistance of "S_2" as the E. M. F. value of "S" is to the E. M. F. value of "S_2".
"d" is the resistance over which the E. M. F. of the Standard Cell is balanced.
"e" is a coil shunting valve of slide wire to some standard value.

the couple, being slightly modified to adapt it to the range of temperature measured. A copper-constantan thermocouple with its cold junction at zero deg. C. develops an E.M.F. of

TABLE NO. I

TEMPERATURE MILLIVOLT RELATION FOR COPPER-CONSTANTAN T ERMOCOUPLE COLD JUNCTION AT 0°C. or 32°F.

Millivolts	Temperature °C.	°F.	Millivolts	Temperature °C.	°F.
0.0	0.0	32.0	2.0	51.1	124.0
0.1	2.6	36.7	2.1	53.5	128.3
0.2	5.1	41.2	2.2	55.9	132.6
0.3	7.6	45.7	2.3	58.2	136.8
0.4	10.1	50.2	2.4	60.4	140.7
0.5	12.7	54.9	2.5	62.6	144.7
0.6	15.2	59.4	2.6	64.8	148.6
0.7	17.8	64.0	2.7	67.0	152.6
0.8	20.3	68.5	2.8	69.2	156.6
0.9	22.8	73.0	2.9	71.4	160.5
1.0	25.3	77.5	3.0	73.5	164.3
1.1	27.9	82.2	3.1	75.7	168.3
1.2	30.5	86.9	3.2	77.8	172.1
1.3	33.1	91.6	3.3	79.9	175.8
1.4	35.6	96.1	3.4	82.0	179.6
1.5	38.2	100.8	3.5	84.1	183.4
1.6	40.8	105.4	3.6	86.2	187.2
1.7	43.4	110.1	3.7	88.3	190.9
1.8	46.0	114.8	3.8	90.4	194.7
1.9	48.6	119.5	3.9	92.5	198.5
2.0	51.1	124.0	4.0	94.6	202.3

approximately 1 millivolt for each 25 deg. It is desirable to be able to detect a 0.5 deg. change in temperature, therefore, requiring readings accurate to 0.02 millivolts. This is accomplished by shunting the low range of the potentiometer circuit with a coil of such a value that the full scale deflection is four millivolts. Referring to Figure 3, showing the electrical diagram of the Leeds & Northrup potentiometer, it is seen that by shunting coil "a" the range can be altered and by proper adjustment can be changed to any desired value less than the original range.

The value of four millivolts for a full scale deflection provides for temperatures up to 95 deg. C. and permits readings of an accuracy of 0.01 millivolt or 0.25 deg. C. with the copper-constantan couple.

To those familiar with a potentiometer no difficulty will be experienced in making this change. The Leeds & Northrup Co. will also make this change on any of their potentiometers at a small charge, or will provide this special range on instruments at a small extra cost.

Galvanometer: Portable potentiometers as supplied by Leeds & Northrup Co. are equipped with a self-contained galvanometer of rather low sensitivity, which, however, is sufficiently sensitive to give within 0.5 deg. C. For greater accuracy we recommend the use of Leeds & Northrup galvanometer listed as No. 2400.

Other Indicating Instruments: The indications of the thermocouple need not necessarily be read on a potentiometer, but can be read on any D'Arsenval type of millivoltmeter of proper range. When this type is chosen only those of high resistance must be used. Such an instrument suitable for this use can be supplied by Chas. Engelhard of New York.

Mounting: For convenience of using on road tests the potentiometer and cold junction bottle are mounted on a stand as shown in Figure 4.

This provides a quick means for moving from one tire to another on the machine and materially increases the speed in taking readings. The wiring diagram is shown also in Figure 2.

Exploring a Tire by This Method: The method provides a means for exploring the tire, since the couples can be inserted in any desired part. Figure 5 shows the positions which have been adopted more or

FIGURE 4

less arbitrarily for the purpose of standardizing our results. These are known as follows:

No. 1—Side edge of tread.
No. 2—Hinge.
No. 3—Tread near surface.
No. 4—Center of tread at breaker.

Figure Nos. 6 and 7 will give an idea of the difference in temperatures obtained in the various positions.

Comparison with other Methods: The Bureau of Standards have been using a different method of measuring tire temperatures based on the gas law, i.e., the pressures of a gas are proportional to its absolute temperature.

$$\frac{P_1}{P_2} = \frac{T_1}{T_2}$$

By measuring the initial temperature and pressure and final pressure, the final temperature of the air in the inner tube can readily be calculated. Figures 6 and 7 show the relation between the two methods. The pressure method gives consistently higher results and in no case did any thermocouple reading show as high a temperature as the pressure reading. This would seem to verify the generally accepted belief that the greatest quantity of heat is generated in the carcass itself and that the transfer of conduction away is out through the tread to the air and road.

Conclusion: A method has been developed whereby temperature measurements can be made on any tire. It is also possible to explore the tire, since the couples can be inserted in any desired part. It is extremely simple and adaptable to either pneumatic or solid tires.

The accuracy of the temperature readings is 0.25 deg. C. while the accuracy of the method itself is somewhat less (probably about 1 deg. C.) due to the difficulty of locating the hot junctions exactly.

EDITOR'S NOTE.—To those who are interested in using this method in their own particular problems the Research Division of The New Jersey Zinc Co. advise us that they will furnish at cost the necessary parts, not including the potentiometer, cold junction bottle, or stand. One outfit as furnished will consist of the following:

2—Tire awls.
1—Connector.
1—30 in. cold junction lead—including glass cold junction well and terminals for connecting to potentiometer.
10⅁—Copper-constantan couples.

They also offer their services to customers desiring to have the range of their potentiometer adjusted for this use, and will furnish a calibration for the potentiometer as well as a table converting scale readings directly to temperature, either Centigrade or Fahrenheit.

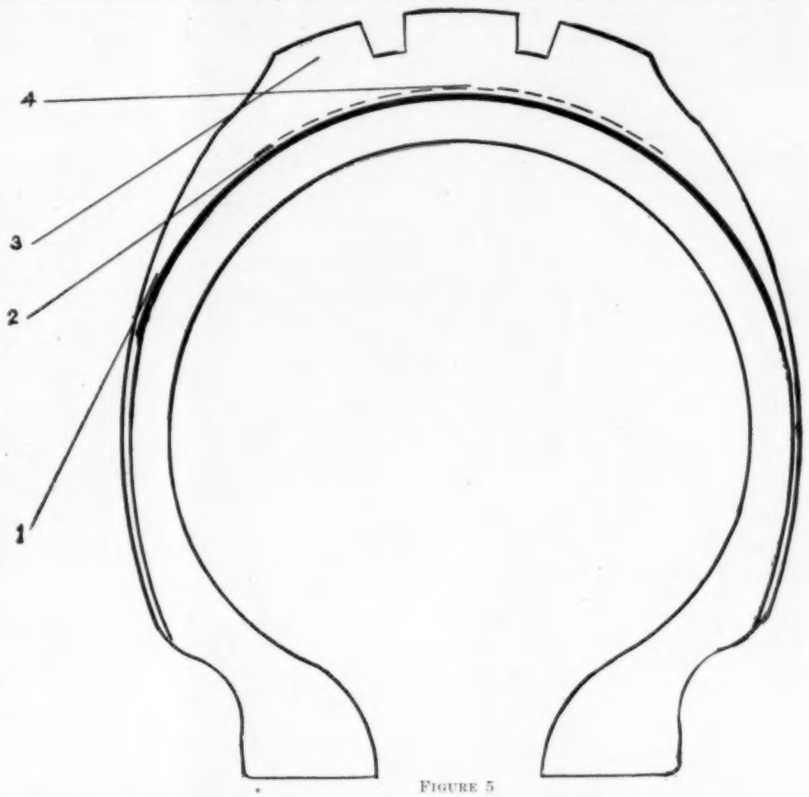


FIGURE 5

TIRE SECTION SHOWING LOCATIONS AT WHICH TEMPERATURE MEASUREMENTS ARE MADE

Solid Rubber Tires — Non-Colloidal Compounds

British Patent No. 165,662 is concerned with the use of a non-colloidal in the structure of a solid rubber tire. There are three objects to this invention. In the first place the new process is intended to reduce the cost of production; secondly, to increase the durability and wearing qualities of the tire and thirdly, it is intended to obtain in this manner a greater degree of resiliency than has hitherto been commercially possible. There are two distinct types of these tires, one in which the internal structure of the tire is built up out of layers of impregnated textile material and the other in which the body of the tire is made out of impregnated rope in part.

In the first case the iron rim into which the tire fits has on its peripheral surface between the side flanges a large number of wide shallow grooves or corrugations. In building up the tire the first step is to coat the rim with a rather thick layer of a neutral amorphous non-colloidal sulphur-terpene compound. This substance is manufactured by heating oil of turpentine or any of the other terpene compounds with sulphur in a vessel provided with a reflex condenser, until the turpentine is partially or practically entirely saturated. A very advantageous property of this substance as far as the solid rubber tire is concerned is that it will adhere very firmly to metal and to glass as well on cooling and solidifying to a hard tough mass. In using this material it is dissolved in a volatile solvent and used just like a thick paint. Toluol and xylol dissolve it very readily to form thin solutions which are used to impregnate and saturate the various fibrous materials which are used in the construction of the tire, such as rope, felt, textile fabrics, cord, etc. This solution not only saturates the interstices of the fabrics with this resinous product but seems to enter into the fibers themselves and has the effect of rendering them proof against rotting by oxidation under the most severe tests.

The iron rim is first coated with two or three coats of this thick sulphur terpene paint as has been mentioned above. Then the rim is wound around with one or more layers of duck fabric which has been impregnated with the dilute solution of the resin. The body of the tire is then built up layer by layer from treated duck and rubber, a spiral wound layer of duck being interposed between each two layers of rubber. The rubber that is nearest the rim is compounded with heavy fillers so that it is not very resilient, while that which is nearest the external surface of the tire does not contain as much filler and is therefore much more resilient. Over the body of the tire there is placed a thick layer of rubber which covers the sides as well as the top and hides the internal structure of the tire completely. The whole tire is then placed in a suitable mould and vulcanized under great pressure. As a result of this treatment a solid mass is obtained, the layers of impregnated fabric being united firmly to the rubber layers and the entire tire being combined very fast to the rim by means of the uniting layers of sulphur terpene resin. The tire need not be wound with impregnated duck only, but other textile materials may be used, such as burlap, linen, hemp, etc.

In the second case where the tire body is built up of cord or rope, a product is obtained which is very well suited for

heavy truck work, where the wear and tear on the tire is exceedingly great. The rope generally used for this purpose is manilla or cotton rope about 3/16 to ¼ of an inch in diameter. The rope is first impregnated with the terpene resinous compound until it is thoroughly permeated with it. The rim of the tire in this case has helical grooves cut into its surface between the flanges of such depth that it can accommodate the rope that is wound around the same, after the latter has been given two or three coats of the terpene resin. The winding of the rope around the tire is accomplished under tension. After the first layer of rope has been formed, a layer of rubber of the right composition, which is preferably a high gravity low resiliency litharge rubber, is placed thereon. On top of the layer of rubber, a second layer of rope is wound in such a manner that turns of the rope in the second layer lie above the spaces between the turns of rope in the first rope layer. Then a second layer of rubber is placed on the rope and this process is continued until the tire is built up completely. The cross-section of the tire resembles a pyramid, the layers of rope decreasing in width as they approach the top of the tire. The entire tire, top and sides, is then encased with a thick layer of rubber which hides the internal structure of the same completely. It is then put into a mould and vulcanized as before under pressure. It is sometimes advisable to place a layer or two of impregnated fabric in between layers of rope, and also to smear the entire rope body of the tire with a solution of this terpene resin so that a more solid union is formed between the body of the tire and the resilient outer rubber coating.

Such a tire possesses many advantages. It is solid, resilient, free from hard or fully saturated rubber; it is very fastly united to the rim and forms with it a single mass; it withstands severe side strains and is extremely durable and wearing.

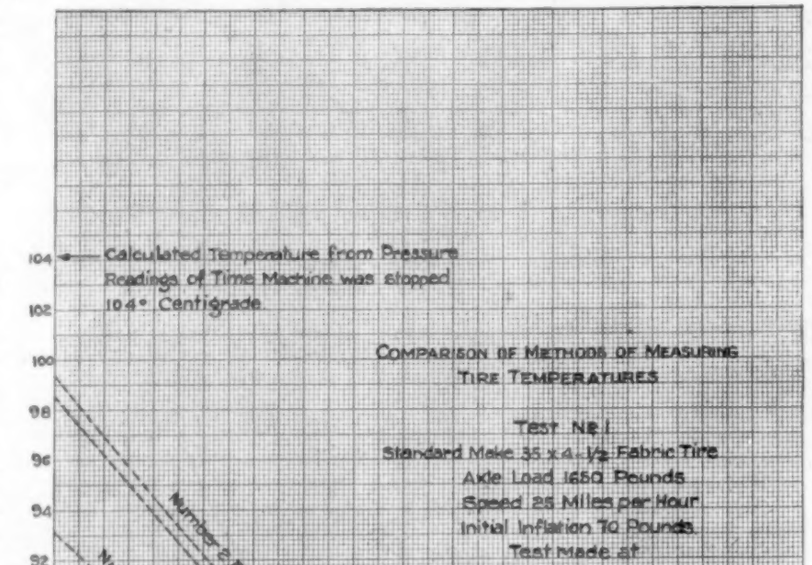

Calculated Temperature from Pressure Readings of Time Machine was stopped 104° Centigrade
Comparison of Methods of Measuring Tire Temperatures
Test No. 1
Standard Make 35 x 4-½ Fabric Tire
Axle Load 1650 Pounds
Speed 25 Miles per Hour
Initial Inflation 70 Pounds
Test Made at Bureau of Standards
September 2, 1921
Number 2 Position
Number 4 Position
Number 1 Position
Number 3 Position
9/5/21
Temp. in Degrees Centigrade
Time - After Machine Stopped

FIGURE 6

(See article on pages 161-163)

Removal of Vulcanized Goods from the Mould

An invention by T. Sloper, Southgate, Devizes, Wilts, England (Patent 169,525) describes a method of removing vulcanized goods from the mould by temporarily stretching by enclosing the goods in a vacuum-chamber whose edge effects a seal with the goods, and then creating a vacuum, or partial vacuum, in the chamber, so that part of the goods within the chamber is flexed away from the mould to destroy the adhesion thereto, and to temporarily stretch the article prior to complete removal from the mould.

The vacuum-chamber comprises a shell which is open on that side intended to be toward the goods when in use, and having a surrounding inwardly directed lip, preferably of flexible material to bear against and effect a seal with the goods when the chamber is in position for use.

Where the apparatus is intended for use in the manufacture of tire bands or parts, the chamber takes the form of a cylindrical sleeve which is of greater internal diameter than the external diameter of the tire band, this sleeve having inwardly directed flexible edges composed, for example, of rubber. In using this apparatus as applied to the removal of tire bands from their moulds, the wrapping round the tire band in the mould is first removed, the band is more or less unstuck from the mould by the usual methods, and then the vacuum chamber is brought into position, so that it surrounds the tire band. The flexible lip at each edge of the vacuum-chamber is brought into contact with opposite edges of the tire band to effect a seal therewith and then the air is extracted from the interior of the vacuum-chamber by an air-pump connected thereto, so that the band or the central portion of the band is flexed away from the mould, whereupon the removal of the band is greatly facilitated.

It will be understood that the function of the vacuum-chamber is to cause the surrounding air to expand or force the article away from the mould in opposition to the tension due to the fabric and rubber of the article. It is said to be found in practice that by this means much larger and stronger articles can be successfully removed from moulds than can be dealt with by the usual methods.

Obviously, the vacuum-chamber may be variously shaped according to requirements, the essential feature being that it shall be so constructed that it effects a seal with the goods to be removed, so that the portion lying within the chamber can be flexed away from the mould by atmospheric pressure.

The flexible lips to the sleeve-shaped mould may be formed by rubber bands, moulded to a smaller diameter than that of the sleeve and then stretched on to the edges of the sleeve with part of each band overlapping; such overlapping portion will have a permanent inward set. In some cases the seal between the flexible lips of the vacuum-chamber and the edges of the tire band may be effected by lifting the edges of the tire bands slightly, by mechanical means, and tucking the flexible lips beneath.

Rubber Celluloid; A New Use for Rubber

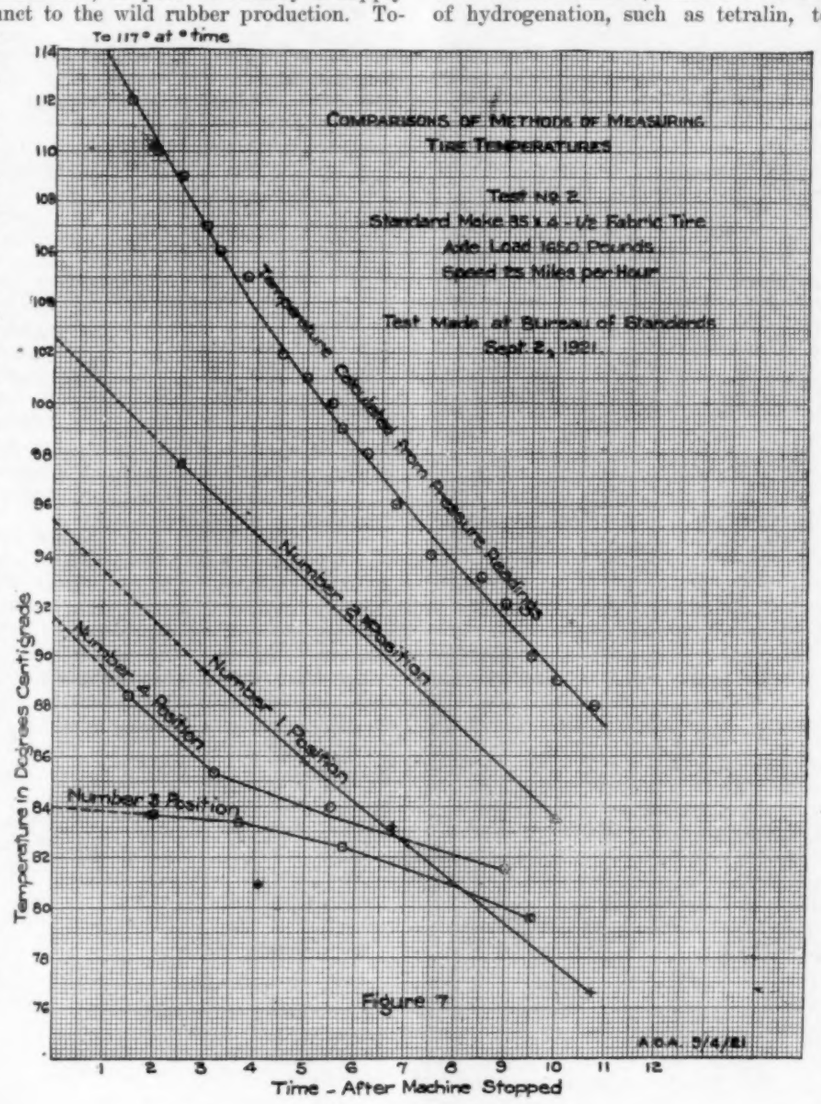
By Ismar Ginsberg, B.S., Chem. Eng.

CONDITIONS change; what may be wanted most today, may be thrown into the discard tomorrow. A decade or so ago, all efforts were bent to the securing of a constant and unfailing supply of rubber by the planting of trees in cultivated plantations, to produce thereby a supply of rubber as an adjunct to the wild rubber production. Today, efforts are being concentrated on finding new uses for crude rubber of which there is a considerable surplus on the market. The British rubber interests have been conducting contests to see if in this way there could not be developed new uses for rubber, but, as has been reported the suggestions that were advanced were somewhat lacking in originality and practicability. The patent literature is full of processes and compositions for using rubber in new ways, such as, in the manufacture of paints, lubricants, oil tanks, etc.

According to Dr. Rudolph Ditmar (see Chemiker Zeitung, 1921, 819-820 and Gummi Zeitung, 1921, 39-40, vol. 36), rubber chemists have been trying to make a celluloid rubber combination for quite some time, but have been balked by the fact that they could not find a general, easily obtainable solvent which would dissolve both rubber and celluloid. Ditmar claims to have accomplished this and his invention opens up an entirely new field for rubber which is of great importance and interest.

Celluloid will dissolve very readily in acetone and amyl acetate for example, but when a rubber solution is added thereto, the rubber is precipitated by these two solvents. On the other hand celluloid is rather insoluble in such common rubber solvents as gasoline, benzene, carbon disulphide, carbon tetrachloride, etc. The properties of a celluloid and cellon, which is a non-inflammable make of celluloid of German origin, are very well known and are made use of in many ways, but the draw-back has always been a deficiency in elasticity. Rubber will add elasticity to these two commodities, if it can be properly combined with them.

Some time ago it was reported in the columns of the RUBBER AGE, that certain new solvents had been developed both for crude and vulcanized rubber. These were the substances called tetralins, which were first produced in Germany during the War and which have now assumed quite an important commercial standing in the solvent industry in that country. Not only have these products, which are known under various names, indicative of their quality and degree of hydrogenation, such as tetralin, tetralin-essence, tetralin extra (dekalin), hexalin, heptalin, etc., been used in dissolving rubber, but they have also found considerable use in Germany in the paint, varnish and lacquer industry. It was reported in 1920 that hexalin formate would dissolve nitrocellulose.


To 117° at * time
Comparisons of Methods of Measuring Tire Temperatures
Test No. 2.
Standard Make 35 x 4 - 1/2 Fabric Tire
Axle Load 1650 Pounds
Speed 25 Miles per Hour
Test Made at Bureau of Standards
Sept. 2, 1921.
Temperature Calculated from Pressure Readings
Number 3 Position
Number 4 Position
Number 1 Position
Number 2 Position
Temperature in Degrees Centigrade
Time - After Machine Stopped
A.G.A. 5/4/21
Figure 7

(See article on pages 161-163)

This gave Ditmar a hint that perhaps celluloid would dissolve in these solvents and he experimented with dissolving old moving picture scrap, which had been freed from its silver bromide coat, in tetralin extra and hexalin. The results were very gratifying. He concludes therefrom that these reduction products of naphthalene, that is, the tetralins form the medium wherewith it will be possible to make cellon and celluloid rubber compositions.

The Ditmar Process

Old film scrap or celluloid waste from celluloid articles manufacture is reduced to the state of a "rubber dough" in a Werner Pfleiderer universal mixing and kneading machine of special construction. Hexalin is poured over it and the mixture is kneaded until a homogeneous mass is obtained. The same process is carried out with smoked sheets or Ceylon crepe or other forms of plantation rubber in another mixing machine. The rubber and the celluloid dissolve in hexalin, each in different proportions. Care must be taken that too viscuous masses are not obtained, for too solid doughs are very difficult to work in the mixing machines. Then in a third Werner Pfleiderer machine the two masses are worked up together to give a homogeneous solution. If this solution is spread out on a glass plate and the solvent is permitted to evaporate, then a very fine celluloid rubber film is obtained, which possesses all the advantageous properties of this new substance, particularly great elasticity. Exact formulae are purposely omitted inasmuch as many products of entirely

different properties can be made by altering the proportion of the rubber to the cellon or the celluloid.

Colloidal Processes

With the aid of the colloid mill, invented by Herman Plauson, in which colored earths are ground to an extremely fine degree of subdivision, it has been possible to color these new substances with beautiful inorganic pigments. For example, ochre has been used with complete success in this connection. When a colloidal solution of the colored earth is made by the use of this mill, a suspension in the solvent is obtained which may be worked up intimately with the celluloid rubber, from which the solid pigment does not precipitate.

Applications

There appear to be an unlimited number of applications to which these new products may be put. Thus, when colloidal mica is mixed with the cellon rubber hexalin solution, there is obtained a material, after the hexalin is evaporated and recovered, which possesses a high insulating value. The insulating mass obtained in this manner may be made in any thickness whatever from the thinnest film to the heaviest plate. If the hexalin is not removed by evaporation, then a lacquer is obtained with which iron pipes, copper wire and wood can be coated and which yields a flexible insulation that will adhere tightly. The new substances are destined to play an important part in the artificial silk industry, in the manufacture of sole leathers, etc. Industry is not very rich in really good lacquers that will adhere. The new substances yield a black lacquer with colloidal niggosine which cannot be distinguished from the famous Japan lacquer.

Up to the present time the handles of sticks and umbrellas have been made separately, which has increased the cost of production considerably. It is now possible to dip a well dried wooden handle, which forms one piece with the stick, into one of the many colored rubber celluloid hexalin solutions and in this way produce handles of great beauty by repeatedly dipping and evaporating the solvent. It is very easy to repair such handles. They are considerably cheaper than moulded handles and have the additional advantage of forming one piece with the stick.

The possibility of producing elastic films is greatly facilitated and for this reason the importance of the new substances for the film and photographic industries is very evident. Combs, hair pins, tortoise-shell substitutes, gramophone records, waxcloth, linoleum, ships' deck covering, etc., may be mentioned as other uses.

There is also the possibility of using these new combinations of rubber and celluloid or rather nitrocelluloses in the manufacture of artificial leather. It is apparent that such leather would be far more elastic and resistant to wear and tear than the product which is now made from nitrocellulose alone. In the manufacture of artificial leather one of the most difficult problems has been to secure a film of nitrocellulose on the cotton background which would be elastic as possible and resistant to friction. Rubber would have been used long ago for this purpose, but there was no common solvent known and rubber alone would not do. The new solvent, hexalin solves the problem, and there is no reason why the rubber industry should not take advantage of this opportunity and develop a new sort of artificial leather.

The cellon-rubber-hexalin mixture can be used to great advantage in impregnating balloon fabrics and the cloth used in making the wings of airplanes. There are many advantages gained with this new composition. It makes the cloth more impervious to gases, it saves putting the impregnated cloth through the vulcanization process, the fabric is more resistant to water, possesses greater elasticity, lighter weight and is non-inflammable.

This mixture is made in the same manner as has been indicated above, except that colloidal aluminum dust is added and worked up with it. The aluminum serves as a protection against radiation. Light yellow ochre pigment may be used in the place of colloidal aluminum, when it is desired to give the balloon and airplane cloth a yellow coloration. Cadmium sulphide may also be used for this purpose. As soon as a homogeneous mixture is attained in the third Werner Pfleiderer mixer, in the same manner as has been described in the manufacture of celluloid-rubber, then the composition is ready for application. The impregnation of the cloth is accomplished best on the spreading machine without the aid of heat. The finished cloth is allowed to dry at best in air for a period of 2 to 4 days, until the hexalin has evaporated completely. The air dried cellon-rubber film is more elastic and more uniform than that obtained by artificial drying with the aid of heat. If it is desirable to hasten the drying process, then it is advisable to dry the cloth partly with the assistance of heat and then finish the drying in air. Ditmar emphasizes the importance of the new lacquer for this purpose, and has found that the more cellon there is in the composition, the more impervious film is obtained. The point of prime importance is that he has secured a fire-proof coating, and at the same time one that possesses all the other requisite properties of a good airplane and balloon lacquer.

Ditmar's investigations and the very favorable practical results, that he has obtained therefrom, are of very great significance. The opening up of a new and apparently exceedingly broad field for rubber is to be welcomed warmly at this time. So far there have not appeared any patents on the new celluloid-rubber and cellon-rubber substances. We wish to call the attention of the readers of RUBBER AGE to the above mentioned use of the Plauson colloid mill, concerning which there was published a short abstract in the journal last Spring. This machine is of special importance to rubber manufacturers, particularly in the regeneration and recovery of old rubber. The use of this machine in connection with these new substances, particularly in their coloration, indicates that our predictions as to its significance to the rubber industry are proving true, and further developments along this line will be watched with great interest.

A Chinese Gutta Tree

The "Tu-Chung" tree of the Chinese, botanically known as Eucommia ulmoides, Oliv., is, for a number of reasons a distinctly interesting plant. Firstly, it is grown by the Chinese for the sake of its bark, which is so highly valued for medicinal purposes that it commands a fancy price. Secondly, the bark contains a material which is of a peculiar gutta-like nature. This exists in the dry state (as is the case with guayule and the "rabbit bush"), and not as a latex, and may be separated by purely mechanical processes. Thirdly, the tree may be readily grown in temperate climates.

An examination of the "gutta" extracted mechanically yielded the following results:—

CHEMICAL COMPOSITION

	Per cent
Moisture	5.0
Ash	2.5
Resin	70.0
"Gutta"	22.5
	100.0

The material is not as plastic as high-grade gutta-percha. It is very tough, but the gutta—after extracting the resin—is decidedly "short," and does not compare favorably with hardened gutta-percha of medium to low quality. The insulation properties of the fresh material seem similar to those of certain secondary guttas, but the aging qualities are poor, hardening and brittleness rapidly setting in. It is thought that it may be possible to improve the aging properties by modifying the methods of treatment, and in view of the very remarkable toughness of the fresh product and of its cultural advantages some further experiments in this direction may be made. The Royal Botanic Gardens in England have already been carrying on quite an extensive investigation of this subject and have published a paper setting forth the facts given in the above resumé. American manufacturers are much interested in all efforts toward finding any rubber-yielding plants or trees that could be cultivated in the temperate zone making possible rubber production in this country.

ABSTRACTS

Technical — General — Commercial

Rubber Used in Paint

In these days every new use of rubber that is proposed, no matter how impractical it may appear on the surface, is worth while following up and bringing to a definite conclusion. A patent has been granted to A. C. Holzapfel on a paint composition which is claimed to be acid proof and in which rubber is used.

The theory is that to make paint acid-proof not only must the pigment be acid proof but the carrier of the pigment or the paint vehicle likewise must be able to withstand the corrosive action of acids. The customary procedure in making acid proof paints up to the present time has been to select some pigment which was known to be acid resistant and grind the same in the usual vehicle. This does not give a true acid-proof paint. But when a certain amount of rubber is dissolved in the vehicle, then a paint is obtained which will resist all corrosive influences.

Rubber does the work and it appears that only a comparatively small amount of it is necessary. About 5 parts of rubber (the rubber is stated to be of good quality, which would exclude regenerated rubber) is dissolved in 95 parts of a hydrocarbon, in order to produce a vehicle of the desired properties. The proportion of the rubber may be varied, dependent on its nature and on the viscosity of the hydrocarbon used. In any case enough rubber is added to obtain a solution of the proper consistency.

Protective Paints for Rubber Tires

The hard vulcanized skin on rubber tires soon wears off due to natural wear and tear, the effect of light and moisture. The surface of the tire then becomes rough and unsightly in appearance. The painting of the tire with a good paint will not only improve the appearance of the tire but also will fill up small cracks and fissures in the same and prevent the moisture and dirt from forcing their way into the interior. Light colored coatings deflect the rays of the sun and prevent the rubber from being overheated, but the coating prevents the tire from cooling off rapidly after it has been ridden at high speed. Painting the tire will also prevent oil from injuring the same.

Before the paint is applied, the tire surface should be carefully cleaned and dried. The paint is applied with a bristle brush in a thin coat. The following paint compositions are recommended. For white coatings, white lead or lithopone ground in rubber solution and thinned with benzine or benzol. For gray, a rubber solution with the addition of pine soot or Frankfurt black. A composition is also made by grinding aluminum bronze in a mixture of lithopone or white lead with rubber solution. The addition of aniline or dimethylaniline improves the paint compositions, giving more elastic coats.

Splicing India Rubber Tubes

British Patent 166,540 is concerned with an apparatus and process for splicing rubber tubes. The tube is folded in the usual manner on a steam heated mandril. An annular flexible air bag surrounds the same and is used to apply pressure to the splice. To prevent injury to the folded parts, the mandril is made of heat insulating material or else it is insulated from the heated portion by a masher of such material, and the opposite end is reduced in diameter to avoid contact with the tube. The apparatus may be used either in hot or cold methods of vulcanizing.

Vulcanizing Tires by Electricity

British patent No. 167,874 is concerned with an electrical process of vulcanizing rubber tires. A circular metallic mold is provided which is arranged to form the secondary coil of an electric transformer. The temperature may be controlled by making the primary coil in sections with independent leads. The mold is clamped together by means of bolts which pass through a hole drilled in the extension of the metallic core. The primary coil is made removable so that it is possible to insert the tire without any difficulty.

Tire Fillers

British Patent No. 167,235 relates to the preparation of a tire filler, which consists of a mixture of 152 pounds of sunflower seed oil or other oil of vegetable origin, 5 pounds of calcium hydroxide, 4 ounces of soluble dyes and 8 pounds of "soap oil." These ingredients are all mixed together very thoroughly and then there are added 16 pounds of sulphur chloride. After standing for 24 hours a further 16 pounds of sulphur chloride is added with agitation, and the mass is transferred to molds. "Soap oil" is an intermediate product in the treatment of crude oil consisting largely of a neutral oil of medium viscosity with varying quantities of paraffine wax.

Sealing Punctures in Rubber Tires

In British Patent No. 167,261 there is described the manufature of a composition which is especially useful in sealing punctures in rubber tires. It consists of Turkish bird-lime, 200 to 320 ounces, wood alcohol 80 to 120 fluid ounces, diatomaceous earth or similar substances 120 to 200 ounces, and water 80 to 120 fluid ounces. There may also be added 2 to 3 ounces of borax, 6 to 10 ounces of shellac and 0.32 to 0.64 ounce of bichloride of mercury. The water is heated to 180 degree F. and the borax is dissolved in it; the solution is then added to the bird-lime with constant stirring and the mixture is allowed to cool to about 150 degree F. At this point the wood alcohol and the shellac are added gradually, and finally the diatomaceous earth is stirred in. A preferred form of tire patch comprises two inner tubes one within the other, with a film of composition between them, and a movable fluid mass of the composition inside the innermost tube.

Swelling of Rubber in Various Liquids

In the *Kolloid Zeitschrift* of August, 1921, there appeared an article by the famous German chemist W. Ostwald on the swelling of rubber in various solvents. The article goes into the mathematical physics of the phenomenon and in it there are developed equations, which connect this property of rubber with others. In particular, it is stated that the swelling up of rubber is a measure of the quantity of solvent required to dissolve it. Both raw and vulcanized rubber were tested. The greater the tendency for the rubber to swell up in a given solvent, the more of that solvent will be required to dissolve the rubber.

Vulcanization of Natural and Artificial Rubber Compositions

A patent has been applied for in Austria (No. 1429) by the Bayer Co. on a method of vulcanizing natural and artificial rubber compositions by the addition thereto of sulphate of aniline or its homologues and derivatives.

NEWS OF THE INDUSTRY

News -- Personals -- Financial -- Building Activities -- New Products

Production and Employment Increasing

The "Men Wanted" Sign Hung out at the Goodrich Factory-Gate for the First Time in Two Years---More Tire Business Expected After The First of the Year---Other Branches Busy

The outlook for 1922 in the rubber trade holds the promise of increased production and steady employment. Reports from all manufacturing centers—Akron, Trenton and New England—indicate that the period of depression, reorganization, wage reduction and price-cutting is about over and that the trade as a whole is speeding into less troubled waters.

The tire business has slowed down considerably from the production of the summer season, but is running steadily on what may be regarded as a satisfactory schedule for this season of the year. Manufacturers have reduced their inventories and bank loans to the lowest point, and are now coming quite definitely into the market for crude rubber, fabric and chemical supplies. This demand is evidenced by the stimulation of prices noted for all these commodities.

Akron is looking for a quickening of the tire business right away after the New Year. The great Goodrich plant is taking back old employes, and on the last day of November the sign "Wanted —500 men" was hung out at this factory-gate for the first time in two years. The production at the Goodrich plant is now reported as averaging 16,000 tires daily. The footwear, mechanical goods and other departments are also speeding up. Goodyear was also hiring more men late in November.

The Firestone Tire & Rubber Co. resumed production after a ten-day shutdown in November for inventory and was reported as making 18,000 tires a day as compared with 20,000 before the inventory. With reduced prices increased production is looked for at this plant right away.

Since the announcement was made of Firestone and Apsley becoming associated in the manufacture of rubber goods at the latter plant at Hudson, Mass., it has been persistently rumored that the Firestone Co. was seriously considering entering other fields of rubber manufacture as mechanical rubber goods, hard rubber goods and druggists' sundries.

As all finished goods inventories in tire factories are the lowest they have been for over two years, it is a self-evident fact that production must be substantially increased in order to take care of the normal spring trade.

In the clothing, footwear and drug sundries and stationers' sundries trades the evidence of bigger business with the approach of winter is naturally much plainer. Some of the footwear plants of the United States Rubber Co. have found it necessary to run night shifts to take care of the orders that came as the cold stormy weather arrived. Shelves had been pretty well cleared of footwear throughout the country.

1921 has been a difficult period, but manufacturers agree that its experiences, hard as they have been, could not have been avoided and that in the final analysis the industry will be on a firmer basis because of them.

Chicago Offices for McKone Tire & Rubber

The McKone Tire & Rubber Co. of Millersburg, Ohio, has established offices in the McCormick Building, 332 South Michigan Avenue, Chicago, where O. S. Tweedy, supervisor of distribution, will have his headquarters. Mr. Tweedy, who was formerly connected with Diamond Rubber Co. and with the United States Tire Co. in New York, went to Chicago to become vice president of the Dryden Rubber Co., a position he still occupies.

The McKone Company is capitalized at $250,000, and is owned by five distributors who take the entire output. The company was elected a firm member of the Rubber Association of America at the November meeting of the Association's Board of Directors.

New Treasurer and Secretary at Goodyear

P. H. Hart has been elected treasurer of The Goodyear Tire & Rubber Company, Akron, succeeding H. H. Springford, who becomes Assistant to the President, with special charge of the Treasury Department, the Comptroller's department and the Merchandise Distribution Department.

Mr. Hart was formerly with Price, Waterhouse & Company who handled the auditing of Goodyear's books prior to the reorganization of the company, and was made Assistant Treasurer during that period.

Charles A. Stillman was recently elected secretary of the Goodyear Co. He comes from the Chicago iron and steel trade where he has been for ten years.

The Tire Plants at Findlay, Ohio

The Giant Tire & Rubber Co., Findlay, Ohio, manufacturers of rebuilt tires, recently moved to the plant formerly owned by the Grant Motor Car Corporation in Findlay. Officials of the company recently stated that $300,000 new capital is being added to their funds which would enable them to extend their business substantially. C. E. Hart is president of the company and John Schaefer secretary and treasurer. About 250 men are now employed at the plant.

A contract has been awarded for a new building 45 x 125 feet at the Giant plant.

The Cooper Corporation of Findlay, which recently dissolved joint business operations with the Giant Tire & Rubber Co., will hereafter manufacture new tires only. They now employ 350 men and hope to run their production up to 1,000 tires per day.

Ajax Strikers Return to Work

(Special Trenton Correspondence)

About 1,000 workmen affected by the strike at the Ajax Rubber Company's plant at Trenton, N. J., returned to work November 28 under an agreement compromising the differences between the men and the management.

Jules Berthier New President of Bergougnan

(Special Trenton Correspondence)

Jules Berthier of France has been elected president of the Bergougnan Rubber Co., Trenton, N. J., to succeed Herbert H. Coleman of East Orange, N. J., resigned. M. Berthier was formerly connected with the Bergougnan factory in France and came here recently to take up the management of their American plant.

New Office for S. M. Mullin & Co.

S. M. Mullin & Co., the crude rubber brokers, are now located in Room 811, 35 Nassau street, New York. Their new telephone number is Rector 0565.

Personal

Walker Evans has been appointed Cleveland representative of Mac Manus, Inc., Detroit, the well known advertising agency. He is well known as an advertising man in the rubber industry having supervised the introductory advertising of Goodyear tires in 1906.

Harry Quine, formerly in the publicity department of the Goodyear Tire & Rubber Co., Akron, has been appointed publicity director of the General Tire & Rubber Co.

Tire Statistics for an Entire Year

Monthly Inventories, Production Figures and Domestic Shipments Covering Pneumatic Casings, Inner Tubes and Solid Tires

In the accompanying table the monthly record of tire production, shipments and inventory for a full year, beginning November, 1920, and ending October, 1921, is presented, as compiled by the Rubber Association of America.

This is the first time in the history of the industry that such complete and detail information has been available and a study of the compiliation will reveal interesting and helpful facts.

November, 1920, to and including October 1921

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

MONTH	PNEUMATIC CASINGS				INNER TUBES				SOLID TIRES			
	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
November, 1920	56	5,880,016	649,742	806,023	40	6,131,935	742,815	920,938	11	298,875	21,355	34,217
December, 1920	43	5,508,380	506,111	1,327,153	43	5,486,929	508,446	1,481,285	12	303,473	16,297	43,828
January, 1921	45	5,319,605	703,430	965,417	47	5,586,163	740,824	1,042,617	12	303,753	21,220	29,116
February, 1921	45	5,193,018	819,892	1,073,756	46	5,415,464	916,627	1,129,881	12	304,374	23,365	29,599
March, 1 921	46	4,597,103	1,163,314	1,614,651	48	5,044,861	1,346,483	1,643,690	12	283,800	28,710	43,926
April, 1921	49	4,527,445	1,651,418	1,785,951	51	4,916,772	1,762,122	1,983,571	12	269,985	28,859	42,080
May, 1921	59	4,451,668	2,100,917	2,085,882	57	4,751,880	2,210,040	2,342,567	12	264,633	35,156	40,122
June, 1921	63	4,154,456	2,313,265	2,643,850	60	3,855,098	2,359,928	3,232,673	11	240,336	28,395	49,867
July, 1921	63	3,892,037	2,570,524	2,757,581	61	3,122,815	3,020,981	3,603,248	11	220,003	35,123	55,678
August, 1921	66	3,934,853	3,043,187	2,894,442	64	3,649,319	4,430,152	3,804,060	11	216,367	55,694	66,866
September, 1921	63	3,340,798	1,929,268	2,047,929	62	3,127,830	3,274,822	2,645,758	11	161,832	37,441	50,276
October, 1921	64	3,545,030	1,928,271	1,675,169	64	4,752,016	2,843,918	2,016,371	10	163,299	46,274	45,911

News of the Rubber Association

Annual Banquet to be Held at the Waldorf-Astoria January 9 --- Treasurer Cox Resigns --- Rubber Heel Statistics May Be Collected --- Traffic Matters

Annual Banquet of Rubber Association

The Twenty-second Annual Dinner of the Rubber Association of America, Inc., will be held in the Grand Ball Room of the Waldorf-Astoria Hotel, New York, on the evening of Monday, January 9, 1922, at 7 p. m.

The Seventh Regular Annual Meeting (under the Association's present Charter) will be held at the Waldorf-Astoria at 2:30 p. m. on the afternoon of the same day.

Rubber Association Treasurer Resigns

William C. Cox of the Guaranty Trust Co., New York, who has acted as treasurer of the Rubber Association of America since 1919, has resigned. The Board of Directors will appoint his successor as soon as practicable. This will probably be at the meeting at the Union League Club, New York, on December 16.

Statistics on Rubber Heels

Consideration is being given by the Rubber Association of America to the inauguration of monthly statistical plan, (separate from the regular monthly mechanical rubber goods sales statistics), which will cover the inventory, production and shipments of rubber heels.

Accounting Committee Meets

A meeting of the Accounting Committee of the Rubber Association of America held on November 18, was very well attended, and another step was taken in the progress of the work of that Committee toward the defining of sound cost principles and fundamentals and the uniform classifying of accounts.

Standard Specification for Railroad Mechanical Goods

The Specification Committee of the Mechanical Goods Division of the Rubber Association and a Committee of the American Railway Association recently completed the formulation of standard specifications for steam hose, tender tank hose, axle generator belting and braided and wrapped air hose.

The specifications referred to were formulated on the basis of the "General Instructions on Standard Methods of Test," which has been adopted by the American Railway Association.

The Joint Committee is now engaged in preparing proposed standard specifications for cold water hose and cotton rubber-lined fire hose.

Westbound Tire Rates to Coast Reduced More than 30 Per Cent

The Traffic Committee of the Rubber Association of America has been in negotiation with the Trans-Continental carriers with respect to a revision of the rates on pneumatic tires, in carloads, from all eastern shipping points to Pacific Coast ports.

After considerable negotiation, the carriers have agreed to establish a rate of $2.75 per one hundred pounds from eastern shipping points to Pacific coast ports, reached by water lines, Los Angeles to Seattle, inclusive, to meet water competition through the Panama Canal.

It will be necessary to submit this proposal to the Interstate Commerce Commission for permission to reduce the rates, and at this time the exact date upon which the new rates will become effective can not be stated.

The percentage reduction in rates agreed to are as follows:

From	Percentage Reduction
Points east of Pittsburg and Buffalo, including New England	37.7
Buffalo, Pittsburgh and Akron Districts	36.5
Detroit and Indianapolis group	34
Chicago territory	32
Mississippi River points	30
Denver territory	7.4

Ocean Rate Reductions from North Atlantic Ports

Steamship lines in the United Kingdom and Continental conferences have agreed upon reductions in ocean freight rates from North Atlantic ports ranging from 2½ to 45 cents per 100 pounds. Some of the reductions were made on account of readjustments due to reductions previously agreed to and some were made to meet the competition of ships not in the conferences.

Ocean freight rates on southbound traffic from North Atlantic ports to Brazil have been declared "open" as the

result of a decision reached by American and foreign steamship lines which compete for that trade. In addition to the American lines, including both Shipping Board and private operators, British, Norwegian and Swedish lines participated in the conference, at which agreement was reached that each line should fix its own rates. According to Shipping Board officials, the rate situation on the traffic involved has been mixed up for some time, and it is believed that the action taken may clarify the situation.

Marking Rubber Goods for Export to Canada

The Executive Committee of the Rubber Sundries Manufacturers Division of the Rubber Association is working on a problem presented by the recent amendment to the Canadian Customs Law, which requires the marking of all commodities imported into the Dominion with the name of the country of origin.

Some uncertainty exists whether the law is to become actually effective on January 1, 1922, as contemplated, because of the very general protest from both Canadian and United States interests.

If, however, the law is permitted to become operative, then arrangements will be made by the Rubber Sundries Division for the shipment of a composite lot of rubber goods so as to reach Canada immediately after the first of the year, with all of the articles marked in such a way as to comply with the spirit of the regulations in a practical manner.

NEW BUILDING OF THE QUAKER CITY RUBBER CO. ON MARKET STREET, PHILADELPHIA

F. A. Seiberling on Business Conditions

In Interview He Predicts Tire Industry will Be on a 50 Per Cent Basis in 1922 As Compared with a 33 1-3 Per Cent Basis in 1921---- Restore Buying Power of the Farmer

F. A. Seiberling, president of the Seiberling Rubber Co., Akron, Ohio, spoke before the Akron Builders' Exchange on November 29 on the subject "Akron and the Present Situation".

"What is the matter with Akron?" the speaker asked in beginning his address. "That is the thing in which we are all concerned."

"There is nothing the matter with Akron considering it in the light of all other cities throughout the country. It reached its peak, it slumped, and now it is experiencing its period of readjustment.

"On the other hand there is much the matter with Akron. It is not what it was two years ago. We were running at full speed at that time; but it was an abnormal condition. Industry went on a royal spree and now we are waking up after the headache.

"The militarists, back in 1914 upset the world. We were thrown into a state of war and it produced abnormal results. Manufacturing went along at too rapid a pace. Everyone enjoyed too great a prosperity. It had to end.

"Now out of the remnant we are attempting to restore the old order. Readjustment is on its way, and we are returning to a normal condition. Circumstances are such that we will never return to exactly what we were before the war, but we will get back to a sound financial and industrial basis.

"But business can not be stabilized unless we are willing to cooperate in the assumption of losses. The big trouble is that we want the other man to liquidate while we hold our own. Any man who is unwilling to accept this change, to assume his share of the loss is an enemy to readjustment."

In a recent interview Mr. Seiberling declared that this country probably never would see another year when as few as a million automobiles would be marketed. When the point of saturation, as it is called, had been reached, he believed that renewals would always exceed a million cars a year.

"Liquidate down to the farmer's level," he said, "so that he may market his products profitably and be in a position to buy what he needs as cheaply as he sells."

"Railroad freight rates, wages, taxes and the cost of fuel all must come down and come down immediately to start the farmer buying again. And it must be borne in mind all the time that there is no hope for any improvement in business until the buying starts with the farmer.

"Fuel enters into the case to a large extent. Coal mine labor must be brought into balance along with railroad labor.

"That will permit the railroads to reduce freight rates to a point where the farmer can market his products for a little better than it costs him to produce. Until that is done the greatest buying power in the country will remain in a state of semi-paralysis.

"Nothing can restore the buying power of the farmer and benefit all industry quicker than freight rates that will enable him to ship his commodities profitably to the needed markets. We can do something for our home situation while the rest of the world is trying to straighten itself out and lay the foundation for the vast export business that is inevitable.

"Highway construction now being undertaken all over the country will be a great aid to the automobile industry.

"That and the economic advantages of the automobile as a means of transportation are the chief reasons why there will be a steady annual increase in the production and sale of automobiles for many years to come."

The tire industry, according to Mr. Seiberling has passed the low point and is on the upgrade.

"Stocks have been largely absorbed, and the business today is as near sound readjustment as any basic industry in the country," he said. "Consumption of tires in 1922 is certain to be greater than that of the present year, and the industry will experience a steady increase following the improvement in general business and the expansion of the automobile trade."

He believed that the industry would be on a 50 per cent basis in 1922 as compared with a 33-1/3 per cent basis in 1921.

Thermoid Increases Directorate

At a recent meeting of the stockholders of the Thermoid Rubber Co., Trenton, called by J. Oliver Stokes, president of the Company, the board of directors was increased from four to nine members as follows: J. Oliver Stokes, William J. B. Stokes, Robert J. Stokes, Frederick S. Wilson, J. O. Bauer, Edmund W. Craft, William D. Pardoe, Ellis L. Pierson and John T. Spicer.

Death of J. B. Dunlop Pneumatic Tire's Inventor

John Boyd Dunlop, aged 81 years, commonly regarded as the inventor of the pneumatic tire, died in Dublin, Ireland, on October 25. He was a native of Scotland and came to Belfast, Ireland, to practice as a veterinarian. Later he removed to Dublin.

Although his name has become a household word in the world of cycling, motoring and road traction, the inventor of the world-famed Dunlop tire, except for a short period as director of the original Dunlop Company was never in nor of the rubber industry, says the *India Rubber Journal* of London.

Accounts differ as to the circumstances under which he developed his idea for the use of pneumatic tires, a patent for which was taken out on the 23rd July, 1888. Probably the most reliable story is that said to have been related by Mr. Dunlop. His ten-years-old son had a tricycle which bumped grieviously on the imperfect Irish roads. Mr. Dunlop felt that something ought to be done about it, and he set to work. "I formed the rims of the wheels," he said, "of American elm. I made an air-tube of rubber, covered it with cloth, and then with rubber again. My son rode this tricycle to Belfast, and people stared and laughed at the clumsy wheels, but he out-distanced other cyclists easily. In May, 1889, I turned out my first racing bicycle with the new tire, and it carried off all the first prizes at the Queen's College sports at Belfast."

Derisive laughter greeted the appearance of the first racing bicycle shod with 2-inch tubes, but the success of the experiment set people thinking. At the Surrey Cycle Meeting at the Oval in the following year G. L. Morris and Arthur du Cros swept the board with the "Irish home-mades" and "bolsters," as the tires were called. A. J. Wilson has told how he feared to ride down the Farringdon Road on a pneumatic-tired ordinary lest the column of air should be pushed up the sides and let the wheel down on the rim. Others declared, in spite of the success of the Irish riders, that it was slower than the solid, and some racing men actually trained on pneumatics but raced on solids. F. W. Shorland was the first to break records on the road and dispel another fallacy that the pneumatic tire, though it might do on the track, was too slow for the road.

Dunlop's patent might have passed into oblivion in the same way as Richard William Thomson's 1845 patent for an elastic tire had not Harvey du Cros, Sr., the amateur light-weight and middle-weight champion of Ireland, realized its possibilities and joined forces with Dunlop.

"Legally I am not the first and true inventor," observed Mr. Dunlop in a letter to the press eleven years ago, referring of course to Thomson's patent, "but I am the first and real inventor of the 'pneumatic tire', so named by me. I placed the tire on the market and founded a vast industry."

The first pneumatic tire company was started in Dublin in 1889, and of the nominal capital of £25,000 only about £18,000 was subscribed. It was combined with a cycle agency, the prospectus putting forward that if the pneumatic tire did not succeed the cycle agency would pay dividends on the shares! Within four years, however, a dividend of 200 per cent was declared. When the tire factory was established in Dublin the residents of Merrion Square, the adjoining residential area, raised an outcry on account of the fumes from the factory, whereupon works were established in England, and the Lincoln Place premises were used as a distributing center for Ireland. Mr. Dunlop was often heard to deplore the fact that Irish people did not share in the benefits which an ever-increasing tire factory would have brought to them.

The great success of the Dunlop tire induced a number of inventors to bring out tires of a similar nature, and during the next few years some thousands of differently constructed tires were placed on the market. The patent of C. K. Welch for securing tires in the rim with endless wires proved a master patent.

Death of Edward F. Pfaff

The untimely death of Edward Francis Pfaff, for seventeen years advertising manager of the *India Rubber World*, came as a shock to the entire trade. It was almost literally true that everybody in the trade knew him and he numbered his warm, personal friends in the trade where he had spent the best years of his life by the score, including his co-workers in the trade journal field. He was a diligent worker making the entire round of the rubber industry from St. Louis and Chicago to Boston twice a year.

His friends had known that for a year past he had been worried about his health, but more recently he had seemed greatly improved. He had just returned from his regular Fall trip through the West when he died suddenly on November 11 at his Brooklyn home from apoplexy, aged 53 years.

In recent years he had been an enthusiastic golfer and was always among those on the links at the Rubber Association outings.

He leaves a widow and one son, Edward Arthur Pfaff, who is engaged in the crude rubber trade. A requiem mass was celebrated at his funeral at St. Gregory's Roman Catholic Church, Brooklyn, on November 14. Interment was in Forest Hills Cemetery, Boston, Mass the following day.

Rubber Goods Exports Increase in October

Exports of manufactured rubber goods from the United States in October were valued at $2,467,649, which is the highest export value recorded by this commodity since February, 1921. Total exports of all manufacturers of rubber for the first 10 months of 1921 have been valued at $25,857,861, which gives an average of $2,585,786 per month.

Mechanical rubber goods and automobile tires made the most important gains in October. Export values recorded in the month were as follows:

Scrap and old	$42,150
Reclaimed	13,951
Belting	173,038
Hose	81,664
Packing	51,434
Boots	28,382
Shoes	171,760
Druggists' rubber sundries	53,356
Casings	1,239,589
Inner tubes	71,530
Solid tires	136,149
All other tires	21,074
Soles and heels	32,546
All other manufacturers of rubber	351,026
Total	2,467,649

The Plant of the Vulcan Rubber Co.

Factory sites, being chosen as they invariably are for utility or convenience to transportation lines, are not generally remarkable for the beauty of their surroundings. The rubber industry has one notable exception to this general rule in the plant of the Vulcan Rubber Co., situated on a wonderfully beautiful site in a grove of maples and beeches three miles west of the city of Erie, Pa. No other factory and hardly any other buildings but those connected with the plant are in sight so that it has somewhat the effect of a factory out in the woods.

It does not follow, however, that they do not enjoy excellent transportation and shipping facilities, as the plant is served by a railroad switch and is only a short distance from trolley lines.

It has a capacity of 500 tires and tubes per day and is well equipped mechanically throughout. They report excellent business the past summer and fall. Their product is marketed through their branches at Newark, N. J. and Chicago.

M. Liebel, Jr. is president of the company. Edward Heuer is secretary and treasurer; Frank Oberkirch, vice president and George W. Brown, general manager. L. W. Hottel, the sales manager, makes his headquarters at the Chicago branch.

Interlocking Cord Tire in Production

The factory of the Interlocking Cord Tire Co., Morgadore, Ohio, has been in operation for two months past employing 50 men and making 100 tires per day. A. N. Burckhart, general manager of the company announces that plans have been completed to finish the factory building, and that the first payment to creditors had been made. Edward Cole, formerly with the B. F. Goodrich Co., is president of the company. R. E. Cartledge, treasurer of the Akron Engineering Co. is treasurer and C. A. Rukamp is secretary.

Interlocking went into the hands of a receiver last summer and some of its officers were indicted for violation of the Ohio "Blue Sky" laws. They are not connected with the reorganized company.

Conference of Planters and Manufacturers

Important Suggestion Offered By Capt. Ernest E. Buckleton at Meeting of British Institution of Rubber Industry—Uniformity In Crude Rubber Standards of Utmost Benefit to Manufacturers

At the inaugural meeting of the Manchester Section of the Institution of Rubber Industry (Rubber Club of Great Britain, Ltd.) November 7, Capt. E. E. Buckleton of Liverpool, who is well-known in the American rubber trade, made the important suggestion of a conference between rubber planters and rubber manufacturers with the idea of improving standards and qualities of crude rubber.

"What is actually wrong with the rubber planting industry", he said, "is the want of co-operation and working knowledge between the actual grower and the manufacturer who uses the rubber. How can this be remedied?

"First, by a conference between the two; failing this, a conference between the manufacturers and representatives of the planters in London.

"Very few planters produce a standard of rubber which can be called uniform in quality, and which a manufacturer can rely upon, and too many kinds are sent to the market in London, and the method of marketing the rubber prevents the manufacturer from being brought in close touch with the importer or producers as rubber can only be sold in Mincing Lane through a broker, who acts in most cases for a dealer, who sells to the manufacturer.

"The price which a manufacturer pays for his rubber is immaterial—what he is most concerned about is paying a fair price allowing the grower a fair profit for his products, just as he expects a fair profit on his manufactured goods, and getting uniform qualities of raw rubber.

"As the Rubber Industry is a very large one, all over the world, the Governments of all countries should be invited to send representatives to such a conference. All countries manufacturing rubber goods, all countries producing raw rubber should be invited.

"The cost of such a conference would amount to very little, and if the Governments would not share, would it not pay the Rubber Growers' Association and the Rubber Shareholders' Association to pay the expenses of delegates to such a conference rather than spend money in such a manner as one has already done, and which the other proposes doing?"

Incidentally Capt. Buckleton made some interesting remarks regarding the Rubber Association of America of which he was one of the earliest members. He said that when the idea of an association of manufacturers was first broached by Henry C. Pearson, Editor of the *India Rubber World*, many years ago, it had been somewhat coldly received, the manufacturers maintaining that the rubber business was a secret one. They did not want to reveal to their competitors the results of their independent efforts.

During the war they had gotten together under the leadership of such men as H. S. Firestone, B. G. Work, G. B. Hodgman and the late Col. Colt. and the wonderful Rubber Association of America with its many co-ordinated departments was formed. He thought it was time for British and other European Manufacturers to get together in the same spirit of co-operation as that shown by the American Manufacturers.

Captain Buckleton has spent considerable time in the United States, and while here made his headquarters in Trenton. He has now resigned from his long and active connection with the North Western Rubber Co., Ltd. of Litherland, Liverpool, and with Alexander Nourry of that company has started in the crude and reclaimed rubber business at 13 Rumford street, Liverpool.

The Business Wisdom of 1921

What is the paramount lesson learned by the automotive industry in 1921?

This question was put to its four hundred affiliated manufacturing concerns by the Motor and Accessory Manufacturers Association. A summary of the replies has just been made public by M. L. Hemingway, General Manager of the Association.

The overwhelming majority of the responses indicate that the chief fundamental lesson learned by the automotive companies during 1921 was the necessity of maintaining conservative, balanced inventories.

Corollaries of this mentioned by most of the companies are the danger of over-expansion and over-optimism; the menace of "over" over-head; the necessity for rigid, but sound economies; and the elimination of "rainbow-chasing."

General conservatism in buying, greater prudence in making commitments, and closer period buying are mentioned by virtually all the executives who contributed to the symposium as last year's principal contribution to business wisdom.

Another significant recurrent note in most of the statements is the lesson learned by manufacturers that the viewpoint of the ultimate consumer must to a greater extent guide production and distribution policies.

The replies are replete with phrases such as these:

"Order more conservatively—respect contracts."

"Quality workmanship at fair prices."

"Keep your house in order."

"Greater efficiency—lower prices."

"Study costs."

The experience of the automotive industry last year, in the opinion of a leading automobile engine manufacturer whose statement is typical of the rest, will be "enormously beneficial in guiding the future policies of the industry. It has taught every one the need for closer period buying."

One large manufacturer sums up the lessons of 1921 thus:

"The paramount thing taught by last year's experience is that the saturation point has been switched from manufacturers' production to used cars, and that until those now in the hands of the dealers can be disposed of, there should be a decided contraction in the new product."

Throughout the statements there is manifest a candid attitude which lends additional value to the analysis of conditions thus presented. There is a readiness to admit past errors of judgment and blunders of commission and omission, and a firm, vigorous readiness to correct these mistakes constructively by facing the 1922 problems aggressively but sanely.

This is expressed as follows by a representative manufacturer: "We must pay attention to fundamental principles in manufacture and in business. Our inventories must be kept within reasonable bounds; we should not sign contracts more or less blindly and in short, we should conform to the laws of sane business, which, for some reason or other, we seemed to have forgotten during the preceeding few years.

"We have learned, also, of the evils of 'over' over-head; we have learned how to economize in our shops; we are thrifty, whereas always in the past we have been reckless; and we are thinking more of what the public or our customers want, rather than what we feel they should use."

Advertising the Needed Stimulus

(Special Trenton Correspondence)

Advertising was declared the needed stimulant to overcome business depression by Charles Parlin, of the Curtis Publishing Company, in an address before 100 members of the Trenton Advertising Club at the Stacy-Trent Hotel, Trenton, on November 30.

He declared the days of easy selling are past and said that business success now depended on advertising and a high grade of merchandise. It was pointed out that the majority of present-day buyers are people with intelligence to recognize and insist upon the best quality.

The speaker said that despite the increased costs of doing business there had been fewer failures during the last two years than at any period since 1882. Increased overhead costs, he stated, were to be met only by greater business volume and this was possible through wide publicity.

John T. Spicer, president of the club, and general sales manager of the Thermoid Rubber Co., presided.

MARKETS

Cottons, Yarns and Fabrics

NEW YORK, DECEMBER 5, 1921

Severe declines in the cotton market during the fortnight were accompanied by lowering prices of most cotton fabrics. Important factors feel that the cotton market has now reached a point where its influence upon the fabric market is practically negligible. The decline in fabrics is thought to have been due more to the desire to go through the inventory season with as small stocks as possible and the market from now on is likely to be steady with an upward tendency.

The Bureau of the Census reports that 7,270,575 bales of cotton were ginned up to November 14. Allowing for the fact that the crop has been ginned with extraordinary rapidity, this report apparently indicates that the total production is between 7,500,000 and 8,000,000 bales, exclusive of linters. Early in the Fall many in the trade expected the production would not exceed 6,250,000, and the last Government forecast as of September 25 was only 6,537.000 bales.

Last year only 67.2 per cent of the crop was ginned to November 14. The highest percentage ginned to this date in any year during the past decade was 84.6 per cent in 1916, and the average during the decade was 74.5 per cent. It is stated, however, by those in close touch with the situation, that well over 90 per cent of the crop was ginned by the middle of this month. The trade generally expects that the crop will not be more than 8,000,000 bales at the outside.

The following are the closing, highest and lowest prices as of Dec. 5:

	Closing	High	Low.
Dec.	17.26a17.39	17.57	17.29
Jan.	17.12a17.14	17.48	17.12
Feb.	*17.11a		
March	17.10a17.13	17.48	17.10
April	*10.91a		
May	16.80a16.90	17.17	16.80
June	*16.59a		
July	16.35a16.45	16.73	16.35
Aug.	*16.15a		
Sept.	*16.00a		
Oct.	15.80a	16.07	15.80

Market— Easy
Trans.— 17.26@17.39.

* Nominal.

SHEETING, DUCKS, BURLAPS

The decline in the raw cotton market caused marked weakness in fabrics during the period under review. A further reason for the decline in fabrics however is the general sentiment which seems to prevail in all textile lines to go over the year with inventories reduced to a minimum. While the mills are not getting the orders that are in keeping with the season the feeling is that business will show considerable improvement after the first of the year.

BURLAPS—There has been little pressure to sell burlap at the prevailing prices. Importers are holding steady and second hand factors seem to have reached a point where actual spots are not plentiful with them.

SHEETINGS—During November there were price reductions varying from ½ cent to 1 cent per yard. Not much business was passed out at the reduced figures buyers and sellers apparently waiting for more stability in conditions.

DUCKS—The war department will sell about 550,000 yards of duck at Boston early this month and about 50,000 yards at Brooklyn about the middle of the month. Definite dates have not been decided.

COTTON STATISTICS

VISIBLE SUPPLY

	Bales.
In America, 2,312,000; Great, Britain, 857,000; Continent, 838,000	4,007,000
MILL STOCKS:	
In America, 1,014,000; foreign, 460	1,474,000
Uncounted towns and on plantations	3,713,000
Carry-over (all kinds) July 31, 1921 (lint cotton, 8,529,000; linters, 665,000)	9,194,000
To which add the probable yield indicated in this report	7,939,000
Linters	276,000 8,215,000
Making the season's supply	17,409,000
Against which we estimate consumption:	
American mills	6,000,000
Foreign mills	6,000,000 12,000,000
Leaving an indicated carry-over July 31, 1922	5,409,000

ALEXANDRIA

Statistics for the week ending Oct. 21, 1921

	ARRIVALS Cantars	EXPORTS (Bales) England	Con'nt	America	TOTAL EXPORTS Cantars	STOCK Cantars
This week	241,268	4,695	2,182	3,921	81,047	1,859,409
Same week 1920	158,389	3,437	961	600	38,135	738,784
" " 1919	299,197	9,621	2,019	100	89,291	944,857
Since 9/1/1921	789,225	44,096	32,208	25,383	773,816	——
Same time 1920	517,365	14,221	7,569	1,350	176,783	——
" " 1919	1,021,282	50,189	7,969	10,916	519,425	——

EGYPTIAN COTTON

During the past two weeks the market has been under the weight of heavy liquidation and a good deal of business has been carried on for American account; it being stated that nearly one half of the Upper crop has been taken by Americans.

Shipping Wrangle Settled

The dispute between the United States Shipping Board and the Liverpool lines over the movement of Egyptian cotton which threatened a disastrous rate war has been settled. William J. Love, vice president of the Emergency Fleet Corporation, in charge of tonnage, announces that an entirely satisfactory arrangement has been made. Under the arrangements American ships will have one half of the shipment of Egyptian cotton direct to this country and will also participate in indirect shipments via the United Kingdom. At a recent meeting of the National Association of Cotton Manufacturers in Boston formal action was taken urging that a reasonable share of the Egyptian cotton imports ought rightfully to come in American ships.

TIRE FABRICS (Square Woven)			
17¼-ounce Egyptian uppers, combed,	lb.	.80 @	.90
17¼-ounce Egyptian uppers, carded,	lb.	.75 @	.85
17¼-ounce Sakellarides, combed,	lb.	1.00 @	1.10
17¼-ounce Sakellarides, carded,	lb.	.87 @	.90
17¼-ounce Peelers, combed,	lb.	.75 @	.80
17¼-ounce Peelers, carded,	lb.	.60 @	.62
CORD FABRICS			
Combed Sakellarides	lb.	.85 @	.95
Carded Sakellarides	lb.	.80 @	.85
Combed Peeler	lb.	.80 @	.85
Carded Peeler	lb.	.60 @	.65
Combed Egyptian uppers	lb.	.80 @	.85
Carded Egyptian uppers	lb.	.80 @	—
DUCKS			
Belting (pound basis)	lb.	.39 @	—
Hose (pound basis)	lb.	.37 @	—
*Enameling	lb.	.28 @	.43
Shoe Ducks	lb.	.38 @	—
Single filling	yd.	.16 @	.20
Double filling	yd.	.19½ @	.21
DRILLS			
37-inch 3.25-yard	yd.	.10¾ @	—
37-inch 2.75-yard	yd.	.12 @	—
37-inch 3.00-yard	yd.	.11¼ @	—
37-inch 3.50-yard	yd.	.10 @	—
37-inch 3.95-yard	yd.	.09¼ @	—
OSNABURGS			
30-inch 7-ounce		.09½ @	—
40-inch 7-ounce		.11½ @	—
SHEETINGS			
40-inch 2.50-yard	yd.	.13 @	—
40-inch 2.85-yard	yd.	.11¼ @	—
40-inch 3.15-yard	yd.	.12¾ @	—
40-inch 3.60-yard	yd.	.11¼ @	—
40-inch 3.75-yard	yd.	.09¾ @	—
40-inch 4.25-yard	yd.	.08¾ @	—
BURLAPS (Carload Lots)			
7 -ounce 40-inch	yd.	3.65 @	—
7½-ounce 40-inch		3.75 @	—
7½-ounce 45-inch		4.60 @	—
10 -ounce 40-inch		4.75 @	—
10 -ounce 36-inch		4.65 @	—
8 -ounce 45-inch		3.80 @	—
10 -ounce 45-inch		3.35 @	—
10½-ounce 40-inch		4.90 @	—

Chemicals and Compounding Materials

THE GENERAL MARKET—NEW YORK, DECEMBER 5, 1921—The market as a whole is suffering from the dullness which is usual at the close of the year. There has been little aside from routine buying for current needs but the underlying sentiment in the market continues optimistic. Inventories on chemicals in the hands of consumers are bound to be very light this year and this it is believed will bring about active buying after the first of the year. Such pressure as developed during the fortnight was doubtless caused by factors who were disposing of goods bought at this year's prices to be free to work on new goods after the new year comes in.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .95	@ 1.00
Aniline oil, bulk basis,	lb.	.18	@ .26
Excellerex,	lb.	.50	@ .65
Formaldehyde-aniline	lb.	.50	@ .55
Hexamethylene-tetramine (powdered)	lb.	.75	@ .80
Paraphenylene-diamine	lb.	1.60	@ 1.75
Thiocarbanilid	lb.	.45	@ .50
Vulcocene	lb.	..	@ ..

Inorganic

Lead, dry red, bbls.	lb.	.10	@ —
Lead, sublimed white	lb.	.07	@ —
white, basic carbonate	lb.	.06½	@ .07¼
Litharge, commercial, bbls.	lb.	.08	@ .08½
Lime, hydrated	lb.	.03	@ —
Magnesia, calcined, extra light	lb.	.50	@ .55
heavy	lb.	.06	@ .07
Magnesite, powdered	ton	50.00	@ 65.00

COLORS

Blacks			
Bone, powdered	lb.	.06½	@ .08½
Carbon black	lb.	.10½	@ .20
Drop	lb.	.09	@ .16
Ivory	lb.	.15	@ .45
Lampblack	lb.	.15	@ .45
Blues			
Prussian	lb.	.50	@ .55
Ultramarine	lb.	.15	@ .35
Cobalt	lb.	.27	@ .35
Rubber maker's blue	lb.	3.50	@ —
Browns			
Iron oxide	lb.	.04	@ .05
Sienna, Italian, raw and burnt	lb.	.04¾	@ .05¼
Umber, Turkey, raw and burnt	lb.	.05½	@ .06
Greens			
Chrome, light, c. p.	lb.	.30	@ .32
medium	lb.	.35	@ .36
dark	lb.	.36	@ .45
oxide	lb.	.50	@ .60
Reds			
Antimony, crimson	lb.	.40	@ .45
golden	lb.	.27	@ .30
red	lb.	.21	@ .25
Indian, pure	lb.	.08	@ .14
Oxide, copperas, pure	lb.	.14	@ —
reduced	lb.	.11½	@ .12½
Para toner	100 lb.	1.40	@ —
Toluidine tone	lb.	2.50	@ 2.75
Tuscan	lb.	.17½	@ .30
Venetian	lb.	.02½	@ .05
Vermillion, English, quicksilver	lb.	.85	@ .87
domestic	lb.	.25	@ .30
Whites			
Albalith	lb.	.06	@ .06¼
Aluminum bronze	lb.	.55	@ .60
Lithopone, Beckton white	lb.	.06	@ .06½
Lithopone, domestic (factory)	lb.	.06	@ .06½
Zinc oxide, American Horse Head Special	lb.	.08	@ .08½
XX red	lb.	.07½	@ .08
Zinc oxide, French process, White seal	lb.	.11	@ .11¼
Green seal	lb.	.09¾	@ .10¼
Red seal	lb.	.08¾	@ .09¼
Yellows			
Cadmium sulphide	lb.	1.25	@ 1.50
Chrome, light, c. p.	lb.	.18	@ —
dark	lb.	.18	@ —
medium	lb.	.18	@ —
Ocher, French	lb.	.02½	@ .03½
domestic	lb.	.02	@ .03
Zinc chromate	lb.	.33½	@ —

COMPOUNDING INGREDIENTS

Aluminum flake	ton	25.00	@ 30.00
hydrate	ton	22.00	@ 25.00
Ammonium carbonate, lump	lb.	.13	@ .13½
Barium dust	ton	100.00	@ —
Barytes, Southern off-color	ton	20.00	@ —
Western, prime white	ton	24.00	@ 28.00
Basofor	lb.	.04	@ —
Beta-naphtol, technical	lb.	.33	@ —
Blanc fixe, dry, f.o.b. works	lb.	.03½	@ —
Chalk, precipitated, extra light	lb.	.03½	@ .04¼
heavy	lb.	.02½	@ .03¼
Clay, China, domestic	ton	7.50	@ 9.00
imported	ton	16.00	@ 24.00
Dixie	ton	22.00	@ 32.00
Blue Ridge	ton	22.00	@ 32.00
Fuller's Earth, powdered	ton	22.00	@ 25.00
Fossil flour	ton	60.00	@ ..
Glues, extra white	lb.	.30	@ .40
medium white	lb.	.22	@ .28
cabinet	lb.	.18	@ .32
cabinet low grade	lb.	.15	@ .18
common bone	lb.	.09	@ .14
Graphite flake, bbls.	lb.	.10	@ —
powdered	lb.	.05	@ —
Ground glass, fine	lb.	.03½	@ .04
Infusorial earth, powdered	ton	60.00	@ —
bolted	ton	65.00	@ —
Liquid rubber	lb.	.15	@ —
Rotten Stone	lb.	.02½	@ .04½
Silica (aluminum)	ton	20.00	@ 22.50
Soapstone, powdered	ton	12.00	@ —
Starch, powdered corn	cwt.	1.85	@ 2.10
Talc, domestic	ton	18.00	@ 20.00
French	ton	22.50	@ 30.00
French, high grade	ton	40.00	@ 45.00
Italian	ton	40.00	@ 45.00
Terra Alba, American No. 1	cwt.	1.85	@ 2.00
American No. 2	cwt.	1.25	@ ..
Tripoli	ton	—	@ —
Whiting, commercial	cwt.	1.05	@ 1.10
Quaker	ton	13.00	@ 15.00
English cliffstone	cwt.	1.60	@ 2.00
glider's bolted	cwt.	1.20	@ 1.35
Paris white American	cwt.	1.30	@ 1.40
Zinc Oxide— 5 per cent leaded		.07¼	@ .07¾
10 per cent lead sulphate	lb.	.0"	@ .07½
20 per cent lead sulphate	lb.	.07	@ .07½
35 per cent lead sulphate	lb.	.07	@ .07½

MINERAL RUBBER

Gilsonite	ton	70.00	@ —
Genasco (c. l. factory)	ton	50.00	@ —
(l. c. l. factory)	ton	52.00	@ —
Hard hydrocarbon	ton	33.00	@ 45.00
Soft hydrocarbon	ton	33.00	@ 40.00
Pioneer M.R.	ton	55.00	@ —
Raven M. R.	ton	—	@ —
320 M. P. hydrocarbon (c. l. factory)	ton	47.50	@ 50.00
300/310 M. P. hydrocarbon (c. l. factory)	ton	42.50	@ 45.00
Synpro, granulated, M.R. (factory)	ton	54.50	@ 64.50

SOFTENERS

Acids			
Acetic, 28 per cent	lb.	.02¼	@ .03
Carbolic (phenol)	lb.	.09½	@ .16
Cresylic, 97 to 99 p. c. pale	gal.	70	@ .75
Muriatic, 20 degrees	cwt.	1.75	@ 2.00
Nitric, 36 degrees	cwt.	6.50	@ 7.00
Sulphuric, 66 degrees	ton	15.00	@ 20.00
60 degrees, bulk	ton	11.00	@ 12.00
Tartaric, crystals	lb.	.35	@ —
Alkalies			
Caustic soda, 76 p.c.	lb.	.04	@ .05
soda ash, 58 p. c.	cwt.	2.10	@ 2.15
Oils			
Castor, No. 3, bbls.	lb.	.12	@ —
Corn, crude, bbls.	lb.	.09	@ .09½
refined	lb.	.11½	@ —
Chinawood, bbls.	lb.	.13½	@ .13¾
Cottonseed,	lb.	.10¼	@ —
Glycerine, c. p. drums	lb.	.14½	@ .15
Linseed, carload spot	gal.	.70	@ —
bbls.	gal.	.72	@ —
Palm, Niger	lb.	.05	@ .06
Lagos	lb.	.07½	@ .07¾
Peanut, domestic crude	lb.	.11	@ —
Pine, steam distilled over 930° sp. gr.	gal.	1.05	@ 1.30
Rapeseed, refined	gal.	.86	@ .90
blown	gal.	.95	@ —
Rosin, first rectified	gal.	.44	@ —
second, rectified	gal.	—	@ —
Tar, commercial	gal.	.28	@ .30
Soya Bean, crude, bbls.	lb.	.08¾	@ .09
Resins and Pitches			
Cantella gum	lb.	.50	@ ..
Cumar resin	lb.	.09	@ .13
Tar, retort	bbl.	10.40	@ 11.00
kiln burned	bbl.	10.00	@ 10.50
Pitch, Burgundy	lb.	.05	@ .06
coal tar	ton	.01½	@ —
rosin	bbl.	5.85	@ —
Rosin, grade B, ex-yard	bbl.	5.55	@ —
grade K	bbl.	6.70	@ —
Shellac, fine orange	lb.	.75	@ .80
Solvents			
Acetone, drums, c.p.	lb.	.12½	@ .13
Alcohol, denatured, No. 1	gal.	.40	@ .41
Methyl, 95 per cent, drums	gal.	.60	@ .63
Ethyl, 190 proof, bbls.	gal.	4.70	@ 4.80
Benzol, 90 per cent	lb.	.25	@ .30
pure	lb.	.27	@ .40
Carbon bisulphide,	lb.	.07	@ .07¼
tetrachloride	lb.	.11	@ .13
Dimethylaniline	lb.	.40	@ .45
Naptha, motor gasoline, steel bbls.	gal.	.24	@ —
Talool, pure drums	gal.	.28	@ —
Turpentine, spirits	gal.	.82	@ —
wood	gal.	.80	@ —
Xylol, pure	gal.	.40	@ .43
commercial	gal.	.28	@ .35
Waxes			
Beeswax white, pure	lb.	.55	@ —
Caranuba, No. 1	lb.	.16	@ —
Ceresin, white	lb.	.12	@ —
Bayberry	lb.	.19½	@ .20
Montan, crude	lb.	.07	@ —
Ozokerite, hard, pure, lb.	lb.	.25	@ —
Paraffin	lb.	.02	@ —
Petrolatum, amber, bls.	lb.	.05	@ .05½
dark amber,	lb.	.04½	@ —

SUBSTITUTES

Black	lb.	.07	@ .14
White	lb.	.08	@ .16
Brown	lb.	.10	@ .15
Brown factice	lb.	.07	@ .14
White factice	lb.	.09	@ .15½
Paragol, soft and medium	cwt.	—	@ —
hard	cwt.	—	@ —

VULCANIZING INGREDIENTS

Lead, black hyposulphite (black hypo)	lb.	.25	@ —
Orange mineral, domestic	lb.	.11	@ .13
Sulphur chloride (jugs)	lb.	.20	@ —
Sulphur flour Brooklyn brand (c.l.)	cwt.	—	@ —
Brooklyn brand (l. c. l.)	cwt.	—	@ —
Bergenport (c.l.)	cwt.	2.55	@ —
pure soft	cwt.	2.30	@ —
superfine (c. l.	cwt.	2.40	@ 2.90

Soda Ash—Sales during the period under review have been large, averaging the heaviest of the year with prices holding strong under demand. Producers reported a steady demand and this from consumers, which is particularly encouraging. Light ash in bags on spot ranged from $1.60 @ $2.00 per 100 pounds for domestic material.

Caustic Soda—November was the most satisfactory month of the entire year and December promises to exceed in sales the record for that month. The export demand was particularly heavy. Producers quoted 76 per cent spot, $3.85 at $4.00 per hundred pounds.

Litharge—Sellers are much more optimistic and there is a better interest manifested in this commodity. Consumers have little on hand and have to buy as they need the material. There has been a slow but steady improvement that started several months ago.

Lithopone—Leading producers say that there will be no material change in prices until after the first of the year. Foreign material continues to come in but notwithstanding this American producers have no reason to complain of the year's business.

Barytes—There has been no particular feature to the market, demand continuing about even with the current output. Producers are fairly well engaged with prime western at $23 per ton f.o.b. at the shipping point; off color quoted at $15 @ $17 per ton.

Aniline Oil—There has been a fair demand with prices ruling between 18 and 20 cents. Low priced offerings have been largely eliminated and the market is in a much firmer position.

Linseed Oil—The situation regarding domestic oil has not changed. English crushers are still doing a good business in this country but there seems to be no disposition to shade prices of the domestic article on this account.

Orange Mineral—The demand for domestic material continued good and little interest was shown in the imported article. Domestic is quoted at 11 @ 13 cents.

Zinc Oxide—Producers report a very good demand from the tire industry. The market has been gradually improving since July and promises to become more active after the first of the year. Advices from abroad indicate that the foreign producers have raised their prices for this commodity. Quotations on domestic remain unchanged.

Whiting—Consuming demand continues to be steady and stocks of both the domestic and foreign material have been moving in a steady volume and there does not appear to be any substantial accumulation.

Blanc Fixe—A much better feeling has shown itself in this market. The market has firmed up considerably and as high as 4 cents a pound for dry has been quoted.

Rapeseed Oil—Offerings continue light with consumers interested in comparatively small or moderate quantities for prompt use. Blown per gallon, 95 cents; refined, 83 at 85 cents.

Palm Oil—The market continues to hold steady with a limited demand, buyers being disposed to hold off and await further developemnts. Lagos, spot 7⅜ at 7⅝ cents; Niger, to arrive, 5¾ at 6 cents.

Crude Rubber

NEW YORK, DECEMBER 8, 1921

The strong undertone of the market which developed during the last half of November, has been maintained during the first week of December, and has witnessed the return of prices to higher levels than a year ago. During the first part of the present month spot ribs and first latex sold up to 21 cents, as compared with 18 to 18½ spot ribs on December 1, 1920, and 19 to 19½ for first latex on the same date.

Predictions are now that 25 cent rubber will be back again in a month's time. It is not so long ago that this was thought an altogether impossible low level for crude rubber. It has now come to be regarded as a goal to be attained. Prices are strongly maintained and any recessions find immediate buyers.

First latex and ribbed smoked sheets are now moving along identical price levels, and quotations on these grades may be regarded as interchangeable.

Without any question the manufacturers—big, little and middle-sized—are in the market for rubber. The reports from London and Singapore indicate that the half dozen largest manufacturers are buying substantial quantities in those markets, and some orders from these most important interests have also been placed through the New York market. Such buying has had the inevitable stimulating effect on prices, which combined with the fact that the great rank and file of manufacturers throughout the country have been buying has given a vastly different aspect to the crude rubber market than for many months past.

London stocks still stand at slightly over 70,000 tons, but private cables state that a great quantity of this rubber is low grade and would not move quickly even under the most favorable circumstances, while the really desirable rubber is held in strong hands.

The reports from the tire manufacturing district centering about Akron indicate a gradually increasing production, and all accounts agree that the industry will be on a considerably higher level of production the coming year.

The leaven of optimism that is beginning to make itself felt in the trade has every indication of being real and substantial as compared with the "whistling to keep up one's courage" that conditions the past year have forced on the trade.

Through the entire depression some one has come out each month with a statement that "the corner of good business had now quite definitely been turned," but as one crude rubber importer expressed it, "We never seemed to get to see what was around that corner. Now we are beginning to see it."

Quotations on the various grades on this date are as follows:

Plantations			
Ribbed Smoked Sheets spot	.20½	@	.20¾
January	.21	@	.21¼
Jan./March	.21½	@	.21¾
Jan./June	.22¼	@	.22½
April/June	.22½	@	.22¾
July/Sept.	.23¾	@	.24
July/December	.24¼	@	.24½
Jan./December	.23	@	.23¾
Smoked sheets plain, spot	.18	@	.18½
First Latex Pale Crepe, spot	.20½	@	.20¾
January	.21	@	.21¼
Jan./March	.21½	@	.21¾
Jan./June	.22¼	@	.22½
April/June	.22½	@	.22¾
July/Sept.	.23¾	@	.24
July/Dec.	.24¼	@	.24½
Jan./December	.23	@	.23¾
Amber Crepe No. 1	.19	@	—
" " " 2	.18½	@	—
" " " 3	.18	@	—
Grand Central Crepe	.18	@	—
Clean Thin Brown Crepe	.17½	@	.17¾
Light Clean Thin Brown	.18	@	.18¼
Rolled Brown Crepe	.17	@	.17¼
Paras			
Maderia Fine	.25	@	.25¼
Acre Fine	.24¼	@	.24½
Up-river Fine	.23	@	.23¼
Up-river Medium	.21½	@	.22
Up-river Caucho ball	.14	@	—
Up-river Coarse	.15	@	—
Islands Fine	.21	@	.21½
Islands Coarse	.10½	@	.11
Cameta	.12	@	—
Xingu Ball	.12	@	—
Tapajos fine, spot	.22	@	—
Pontianac			
Prime Pressed	.13	@	.13½
Plantation	.07	@	—
Bangermassin	.08½	@	.08¾
Palembang	.09¾	@	.10
Siak Gutta Percha	.17¾	@	.18
Prime Mancassar	2.75	@	2.87½
Balata			
Panama Block	.25	@	.40
Surinam Sheets	.69	@	.71
Columbia Block	.45	@	.47
Venezuelan Block	.56	@	.57

Reclaimed Rubber

NEW YORK, DECEMBER 8, 1921

The reclaiming situation brightens as the price of crude rubber goes above 20 cents per pound. The largest reclaimers feel that business will soon be coming to them in good volume. At the moment the industry is on about 30 per cent production. There is considerable evidence of new business, however, and conditions are immeasurably more encouraging than last summer or spring. Prices have not changed to any appreciable extent in recent weeks.

Quotations are nominally as follows:

Standard Reclaims			
Floating	$.12	@	$.13
Friction	.12	@	.13
Boots and Shoes	.10	@	.10½
Boots and Shoes (washed	.13	@	.14
Mechanical	.08	@	.10
Hose	.10½	@	.11½
Tires, truck	.08	@	.09
Tires, auto	.09	@	.10
White	.13	@	.14

Scrap Rubber

NEW YORK, DECEMBER 8, 1921

More activity has been evidenced recently in the scrap rubber market as reclaimers show more inclination to add to their stocks. Prices have advanced slightly on some grades, boots and shoes having been sold at ¼ cent a pound over prices prevailing during the fall. Inner

tubes have advanced ¼ cent to ⅜ cents per pound.

Quotations of this date are as follows:

Auto tire peelings	.01	@	.01¼
Standard White auto	.01	@	.01⅛
Mixed auto	.00⅝	@	.00⅞
Bicycle tires	.00½	@	.00¾
Solid truck tires	.00⅝	@	.01
Boots and Shoes	.03¼	@	.03⅝
Arctics, trimmed	.02¼	@	.02½
Arctics, untrimmed	.01¼	@	.01¾
Inner tubes, No. 1	.03½	@	.03¾
Inner tubes, compounded	.02¼	@	.02½
Battery jars, black	Nominal		
Batteryjars, No.1 bright fracture	"		
Inner tubes, red	.02⅜	@	.02½
Heels and pads	Nominal		
Black mixed	.00¼	@	—
Garden hose	.00½	@	—
Air brake hose	.05⅝	@	—
Red packing	.01½	@	—
Red mixed rubber	.02	@	—
White mixed rubber	.01⅝	@	—

To Take over Gla-Morgan Plant

The plant of the Gla-Morgan Tire & Rubber Co., Oak Hill, Jackson Co., Ohio, it is reported, is to be taken over by a new company headed by Walter Kline as president and in which W. A. Byrider and G. W. Alden, all of Akron are interested. Kline was formerly president of the Interlocking Cord Tire Co. of Morgadore. This plant was started in May, 1919, but has been closed down for some time. It is planned to install new machinery, and start operations as soon as possible. An office, was formerly maintained in Columbus.

Will Continue "Portage" and "Huskie" Tires

The Seiberling Rubber Co., which recently acquired the plant of the Portage Rubber Co. at Barberton, Ohio, will have no delay in getting started at actual production. The company will continue, uninterrupted, the manufacture and sale of "Lehigh", "Portage" and "Huskie" tires, the products of the Lehigh and Portage plants, it is said, together with the new "Seiberling Cord Tire", which the company considers one of their most important products.

Excel Rubber Co. Fails

J. D. Irwin has been appointed receiver of the Excel Rubber Co., Wadsworth, Ohio, which was established by M. H. Leatherman of Wadsworth last July. About 125 men had been employed there most of the time, and the production had been 75 tires a day. The company was capitalized at $2,000,000 with $600,000 paid in.

Venner General Manager of Cumberland Tire & Rubber

The Cumberland Tire & Rubber Co., Louisville, Ky. has appointed A. W. Venner as general manager. He has been in the rubber industry 32 years, the greater part of this period with the B. F. Goodrich Co. at Akron, and latterly with the Fisk Rubber Co.

A Correction

Under the heading New Incorporations in the October 10 issue of THE RUBBER AGE, appeared an item referring to A. Schrader's Son, Inc., of Ohio, as manufacturing and dealing in tires. This was incorrect as the company manufactures and deals in tire valves and pressure gauges of all kinds; the same as the parent company which has its main office in Brooklyn, New York.

New Incorporations

NEW YORK

Durant Tire & Rubber Co., Inc., to manufacture tires. $30,000. Incorporators: G. Young, 64 West 96th street; A. Knopfer, 74 Columbia street—both of New York City; R. Weiss, 7 Glendale Place, Brooklyn, New York.

Ever Stitch Products Corporation, to manufacture rubber goods. $25,000. Incorporators: B. Rosenthal, 36 Highgate avenue; S. Marcovitz, 253 Hickory street; J. A. Ford, 119 Oakland Place—all of Buffalo, New York. Principal office, Buffalo, New York.

Fox Tire & Rubber Co., Inc., to manufacture tires and rubber goods. $500. Incorporators: E. R. Dodge, M. R. Roche and I. M. Detzen—all of 61 Broadway, New York City.

Middletown Raincoat Co., Inc., to manufacture rubber coats. $20,000. Incorporators: M. and P. and L. Douglin, 57½ Cottage street, Middletown, New York. Attorney, R. L. Noah, 1482 Broadway, New York. Principal office, Middletown, New York.

Berryman Rubber & Tire Corporation, $200,000. Incorporators: H. M. Wise, E. Gibbs, E. J. Sisley. Attorneys, Lee, Aron & Wise, 7 Dey street, New York City.

Hellman Bros. American Auto Tire and Supply Co., Inc., to manufacture auto tires etc. $10,000. Incorporators: A. and E. Hellman of 31 West 111th street; M. B. Hellman, 1451 Wilkins avenue—both of New York City.

DELAWARE

Miles-On Company, to deal in tires. $60,000. Incorporators: K. L. Eddy, A. W. Rennacher, J. L. McDonnell. Delaware agent: Corporation Trust Company of America, Du Pont Building, Wilmington, Delaware.

Braender Rubber & Tire Co., to manufacture sell and deal in tires. $1,000,000. Directors: Milton Dahmann, H. Cross, I. K. Watson, C. E. Shreffler, R. Boyd, C. A. Horton, R. J. Trimble, J. M. Detjen, F. L. and W. P. and H. Braender. Principal office, 7 West 10th street, Wilmington, Delaware.

Century Plainfield Rubber Co., to manufacture and deal in tires and inner tubes. $30,000. Incorporators: H. McInerney, 220 West 42nd street, New York; M. B. Kennelly, 345 Willett avenue, Port Chester, New York; A. G. Armstrong, Moseley, Virginia. Delaware agent, C. V. Mannering, 916 King Street, Wilmington, Delaware.

Universal Packing Corporation, to manufacture and deal in rubber goods. $200,000. Incorporators: F. R. Hansell, J. V. Pimm, both of Philadelphia, Pennsylvania; E. M. MacFarland, Camden, New Jersey. Delaware agent, Corporation Guarantee and Trust Co., 927 Market street, Wilmington, Delaware.

Sectional Tire Works, Inc., to manufacture and deal in tires. $60,000. Incorporators: M. L. Rogers, L. A. Irwin,, W. C. Singer—all of Wilmington, Delaware. Delaware agent, Corporation Registry Co., 100 West 10th street, Wilmington, Delaware.

Seiberling Rubber Co., to manufacture and deal in gutta percha and rubber goods of all kinds. $5,000,000 preferred stcok at $100 par value and 500,000 shares of common at no par. Incorporators: F. L. Croteau, M. A. Bruce and C. H. Blaske— all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, DuPont Building, Wilmington, Delaware.

NEW JERSEY

Nottingham Rubber Company, to manufacture rubber products, tires etc. $500,000. Principal office, 150 East State street, Trenton. Incorporators: C. F. Fisk, 150 East State street, I. Alexander—both of Trenton, New Jersey; S. H. Bell, Reading, Pennsylvania.

OHIO

Hanner-Swanger Co., to buy, sell and deal in tires and tubes. $25,000. Officers: G. S. Shaeffer, president; F. C. Swanger, vice president; C. A. Hanner, secretary and treasurer; W. R. Hanner, manager. Principal office, Cleveland Avenue and Fourth street, N. W., Canton, Ohio.

TENNESSEE

Davis Tire & Motor Parts Co. $100,000. Principal office, Nashville, Tenn.

MICHIGAN

The Michigan Rubber Heel Co., to manufacture rubber and fibre products. $15,000. Principal office, Detroit, Michigan.

WEST VIRGINIA

B. & B. Tire & Rubber Co. $5,000. Incorporators: George E. Beans, James H. Beans, George L. Bauer, Mrs. George Bauer and A. M. Rodgers, all of Wheeling, West Virginia.

INCREASE

Merritt Rubber Co., of New York. $10,000 to $20,000.

New England Tire & Rubber Co. of Holyoke, Mass. $3,000,000 to $3,500,000.

DECREASE

Utility Rubber Goods Co., Cleveland. $150,000 to $100,000.

NAME CHANGES

Tire & Rubber of Philadelphia, Pa. to Vulcanizing Machine Co.

Fisk Rubber Co. of New York to Fisk Tire Co.

American Rubber Patents

ISSUED NOVEMBER 1, 1921

1,395,410—To Robert P. Hassler, Akron, Ohio, assignor to the B. F. Goodrich Co., New York, N. Y. A method and apparatus for marking rubber strips.

1,395,413—To Harry A. Hoffman and Walter H. Juve, Akron, Ohio, assignors to the B. F. Goodrich Co., New York. The art of mixing rubber with comminuted metal.

1,395,434—To Curt Kuentzel, Akron, Ohio, assignor to the B. F. Goodrich Co., New York. A tire-core-stripping machine.

1,395,309—To Percy Edward Taber and Samuel Maurice Taber, Berkeley, Calif., Rose Taber administratix of Samuel M. Taber deceased. A tire dressing wheel.

1,395,686—To Geo. W. Lindley, Philadelphia, Pa. A pneumatic tire.

1,395,770—To Harlan S. Rector, Chicago, Ill. A pneumatic tire.

1,395,420—To Evan S. Johnson, Louis, Okla. A spring tire.

1,395,576—To Aaron E. Jennings, Onensboro, Ky., assignor of one-half to S. I. Gish, Central City, Ky. A tire tread.

1,395,296—To Elmer Quinn, Philadelphia, Pa. A tire vise.

1,395,944—To William A. Brubaker, Akron, Ohio. A tire vulcanizing mold.

1,395,731—To Nathan F. Rice, Chicago, Ill. A valve pad for pneumatic tires.

ISSUED NOVEMBER 8, 1921

1,396,134—To Walter Scott Martin, Flint, Mich. A demountable rim.

1,396,589—To Frederick C. Peace, Harrisburg, Pa. A demountable rim.

1,396,313—To Wilbur C. Belknap, New York, N. Y., assignor to Robert E. Miller, Inc., New York, N. Y. A rubber boot, shoe etc.

1,396,138—To Clifford Co., Mosher, Lima, Ohio. A machine for treating rubber compound or other plastic materials.

1,396,103—To Albert W. Edeborg, Jamestown, New York. A tire chain fastener.

1,396,284—To Karl Riddle, West Palm Beach, Fla. A flat-tire alarm.

1,396,648—To Stephen D. Mills and Hiram Paul, Oklahoma, Okla. An automobile tire filler.

1,396,217—To William Martin Jones, Jr., Rochester, New York. A tire making and repairing device.

1,396,697—To Edward Breuer, Pilsen, Austria. A pneumatic tire.

1,396,170—To William H. Emeng, Chelsea, Mass., assignor to Simplex Pneumatic Tire Co., Boston, Mass. A pneumatic tire.

1,396,515—To Walter S. McClevey, St. Louis, Mo. A pneumatic tire.

1,396,141—To H. P. Neptune, San Diego, Calif. A pneumatic tire pressure gage.

1,396,707—To Harry A. Miller, Akron, Ohio, assignor to the Goodyear Tire and Rubber Co., Akron, Ohio. A pneumatic tire removing apparatus.

1,396,200—To Vivian Harvey and Charles D. Harding, Platteville, Mo. A puncture proof tube protector for automobile tires.

1,396,145—To Frank M. Roessing, Sharpsburg, Pa. A mandrell for making inner tubes.